SERVICE MANUAL

FISHER

CASSETTE TAPE DECK

CR-123 (EUROPE)

This is a service manual for model CR-123 and only items changed from model CR-125 are indicated. For other items, refer to Service Manual for model CR-125.
* mark represents a non-interchangeable part.

Key No.	CR-125	CR-123	Description	Remark
	(PACKAGE)			
	141-6-1419-51502	141-6-1419-51506	Individual Carton	*
	(ACCESSORIES)			
	142-6-4119-17900	142-6-4119-21700	Instruction manual	*
		131-6-4159-28601	Notes, AC Cord (Add.)	*
	(CABINET)			
	141-0-1119-77502	141-0-1119-77503	Completed Front Cabinet	*
	141-0-1249-18100	141-0-1249-18101	Cassette Lid Ass'y	*
	141-2-1419-13304	141-2-1419-13313	Rating Plate	*
	(MICROPHONE JACK PCB ASS'Y)			
	4-1329-76960	4-1329-76982	Microphone Jack PCB Ass'y	*
	(HEADPHONE JACK PCB ASS'Y)			
	4-1329-76970	4-1329-76971	Headphone Jack PCB Ass'y	*

Add this sheet to Model CR-125 Service Manual.

FISHER HiFi Europe Vertriebs-GmbH

Sep./'81/2300 SI Printed in Japan

WM-6641

SERVICE MANUAL

FISHER

CR-125

Stereo Cassette Deck with
Metal Tape Capability,
Powered Mechanism,
Auto Search Function
and DOLBY Noise Reduction System
(EUROPE)

POWERED MECHANISM
FISHER
STEREO CASSETTE DECK

THE FIRST NAME IN HIGH FIDELITY

CONTENTS

Specifications 3
Disassembly Instructions . . . . 4 & 5
Mechanical Adjustments . . . . 6 – 8
Electrical Adjustments . . . . 9 & 10
Pars List . . . . 11 – 15
Exploded View (Cabinet A) 16
Exploded View (Cabinet B) 17
Exploded View (Cabinet C) 18
Exploded View (Chassis A) 19
Exploded View (Chassis B) 20
Exploded View (Chassis C) 21
Exploded View (Chassis D) 22
Block Diagram . . . . 23 & 24
IC &Transistor Lead Identification 25
Power Supply P.C.Board 26
Amplifier P.C.Board ((Top View) . . . . 27 & 28
Amplifier P.C.Board (Bottom View) . . . . 29 & 30
Wiring Diagram . . . . 31 & 32
Schematic Diagram . . . . 33 & 34

SPECIFICATIONS

Power Source	AC 120/220V (50/60Hz)
Power Consumption	14W
Recording System	AC Bias
Erasing System	AC Erasing
Tape Speed	1-7/8ips. ±3%
Wow & Flutter	0.06% WRMS
Torque	
Playback	35 - 70g-cm
Fast Forward	50 - 120g-cm
Rewind	50 - 120g-cm
Fast Forward Time	90sec. (with C-60 cassette tape)
Rewind Time	90sec. (with C-60 cassette tape)
Frequency Response (Overall, DOLBY : OFF)	
Fe2O3 (±3dB)	30 - 14,000Hz
CrO2 (±3dB)	30 - 14,000Hz
Metal (±3dB)	30 - 15,000Hz
Signal to Noise Ratio (According to CCIR method: Weighted, DOLBY : ON)	
Fe2O3	60dB
CrO2	62dB
Metal	62dB
Signal to Noise Ratio (According to CCIR method: Weighted, DOLBY : OFF)	
Fe2O3	48dB
CrO2	52dB
Metal	52dB
Erase Ratio (Overall)	
Fe2O3	70dB
CrO2	70dB
Metal	70dB
Crosstalk (with Fe2O3)	
Track to Track	70dB
Channel Separation (with Fe2O3)	40dB
Harmonic Distortion (K3)	
Fe2O3	1.5%
CrO2	1.5%
Metal	1.5%
Input Sensitivity and Impedance	
Microphone	1mV/10k-ohm
LINE IN	100mV/50k-ohm
DIN INPUT	0.1mV/1k-ohm
Output Level and Impedance	
LINE OUT	500mV/2.5k-ohm (47k-ohm load)
DIN OUTPUT	500mV/32k-ohm (470k-ohm load)
Headphone	30mV/500ohm (8ohm load)
Oscillation Frequency	85kHz
Dimensions (W x H x D)	440 x 118 x 255mm
Weight	4kg

—Specifications subject to change without notice.—

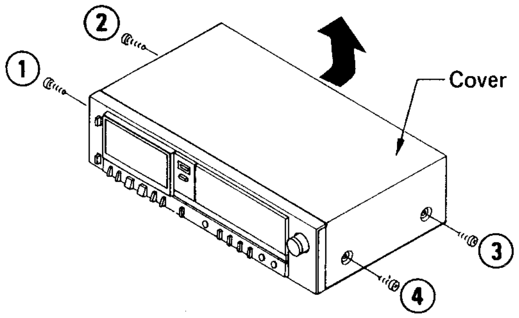
DISASSEMBLY INSTRUCTIONS

GENERAL REMARKS

Before disassembling the unit, spread a soft cloth or a rubber mat on the workbench to avoid scratches and grease spots.
As static electricity is likely to damage transistors and ICs, spread a cloth or the like which does not cause static electricity.
Reassemble the unit correctly noting the kinds of fastening screws and leads. Please refer to the circuit diagrams and exploded views.

COVER REMOVAL

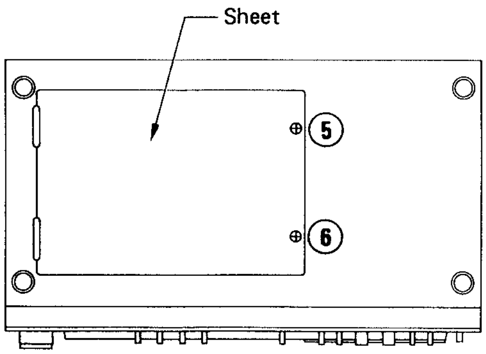
1. Remove the four screws (1 — 4) fastening the Cover.



2. Remove the Cover by lifting it.
3. Reassemble in reverse order.

SHEET REMOVAL

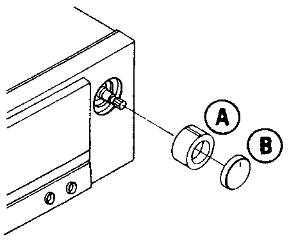
1. Turn over the unit onto a clean soft surface.
2. Remove the two screws (5 and 6) fastening the Sheet.
3. Remove the Sheet by lifting the screw-tightened side of the Sheet.



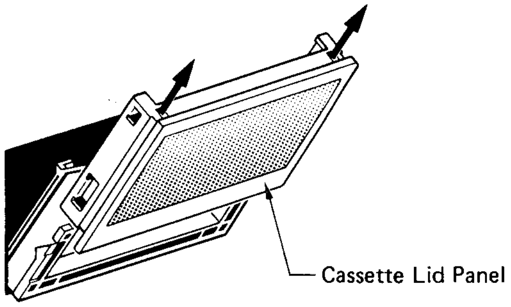
4. Reassemble in reverse order.

FRONT PANEL REMOVAL

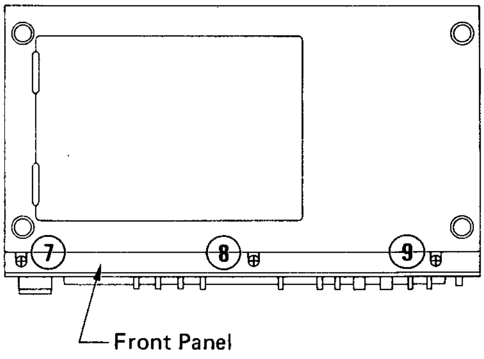
1. Remove the Cover and pull out the Input Level Control knobs (A and B) from the unit.



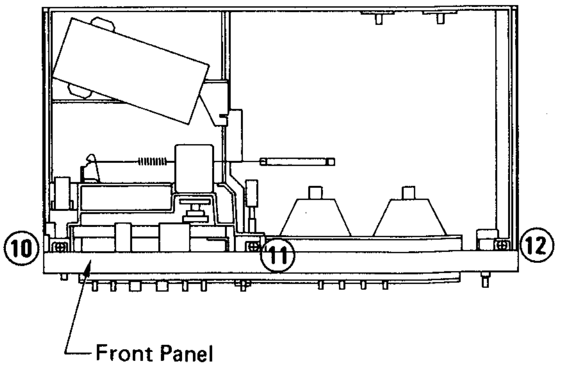
2. Open the cassette holder by pressing the Eject button and remove the cassette compartment lid by grasping the both sides and pulling it off. Then, close the cassette holder by pushing it on top of the frame.



3. Disconnect the four connectors of the Indicator P.C.Board leads from the Amplifier P.C.Board. Then, turn over the unit and remove the three screws (7 — 9) fastening the lower side of the Front Panel and turn over the unit again.



4. Remove the three screws (10 — 11) fastening the upper side of the Front Panel. Then, remove the Front Panel from the unit.



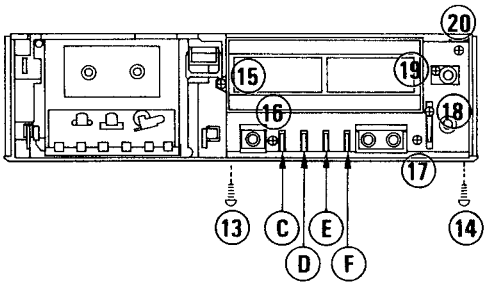
5. Reassemble in reverse order.

DISASSEMBLY INSTRUCTIONS (Continued)

CHASSIS PANEL REMOVAL

1. Remove the Cover and Front Panel by following the instructions for them. Then, remove the four switch knobs (C – F) from their switches by pulling them out.

2. Remove the two screws (13 and 14) fastening the lower side of the Chassis Panel, and the six screws (15 – 20) fastening the Chassis Panel.



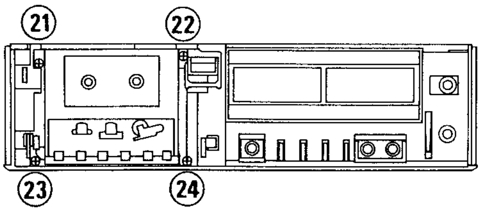
3. Remove the Chassis Panel, noting the lead wires.

4. Reassemble in reverse order.

MECHANISM CHASSIS REMOVAL

1. Remove the Cover and Front Panel by following the instructions given previously. Then, remove the Spring (G) from the Record Spring Lever.

2. Remove the four screws (21 – 24) fastening the Chassis and then, remove the Mechanism Chassis from the unit, noting the lead wires.



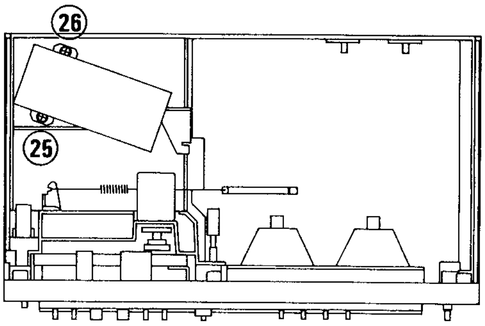
NOTE:
If necessary, disconnect the lead connectors.

3. Reassemble in reverse order.

POWER SUPPLY P.C.BOARD REMOVAL

1. Remove the Cover from the unit.

2. Remove the two screws (25 and 26) fastening the Power Transformer and detach the Power Supply P.C.Board from the unit.

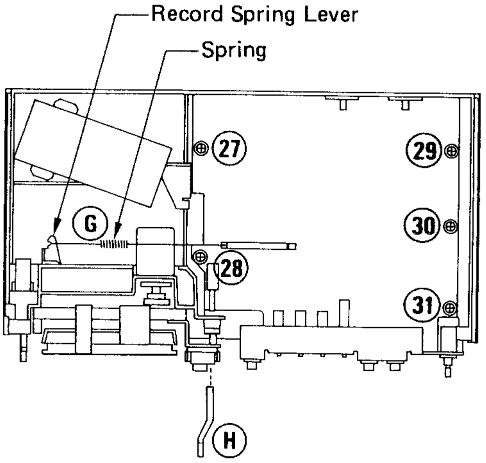


3. Reassemble in reverse order.

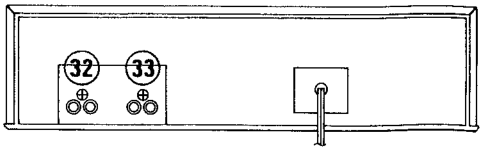
AMPLIFIER P.C.BOARD REMOVAL

1. Remove the Cover, Front Panel and Chassis Panel by following the instructions given previously. Then, remove the Spring (G) from the Record Spring Lever.

2. Pull out the Record Mute Switch knob (H) from its switch and remove the five screws (27 – 31) fastening the Amplifier P.C.Board.



3. Remove the two screws (32 and 33) holding the Line Jacks on the rear of the unit.



4. Remove the Amplifier P.C.Board from the unit, noting the lead wires.

   NOTE:
   If necessary, disconnect the lead connectors.

5. Reassemble in reverse order.

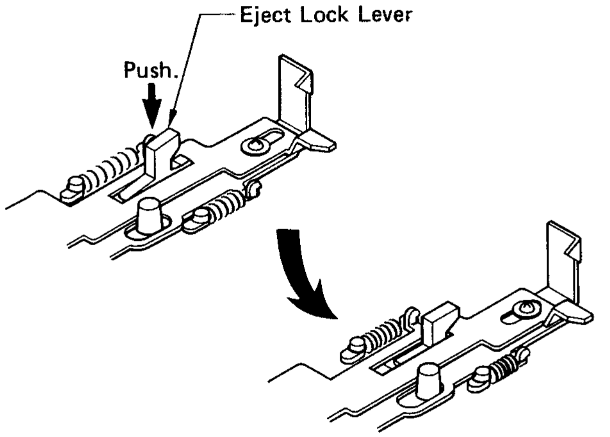
MECHANICAL ADJUSTMENTS

EQUIPMENT REQUIRED

- Cassette-type Torquemeter (100g-cm/160g-cm)
- Silicone Grease (SHIN-ETSU SILICONE: KS-64)
- Round-nose Pliers
- Plus Screwdriver
- Paint or glue

GENERAL REMARKS

- Before adjusting the mechanism of the unit, clean the tape contacting surfaces with a soft cloth soaked in alcohol.
  Trouble may occur because of oil and grease stains.
- The belts must be kept clean while an adjustment or repair work is performed.
  Silicone grease (SHIN-ETSU SILICONE KS-64) is applied to the Wind Belt to protect it from abrasion.
- Silicone grease is not applied to the wind belt for servicing.
- If the Pinch Roller or belt has quality deterioration such as scratches, replace it with a new one.
- This mechanism does not function when power is not supplied and any one of the buttons is pressed.
- The mechanism stops functioning soon when the cassette holder is opened and one of the select buttons (except for the Pause button) is pressed because the Eject Plate and the Lock Plate are locked by the Eject Lock Lever.
  If the mechanism is required to function under this condition, push the Eject Lock Lever as illustrated, so that the Lever is released and the mechanism functions normally.



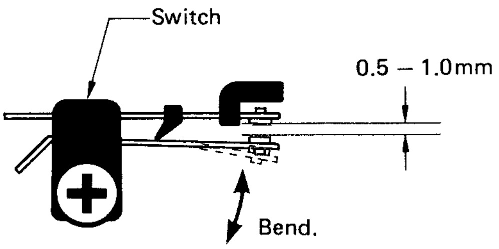
Position Adjustment of Leaf Switches

This model has the following five leaf switches. Checking and adjustment for each switch shall be conducted in accordance with each adjusting items. The unit should be set in the stop mode at each adjustment.

* Trigger Switch
* Motor Switch
* Muting Switch
* Pause Switch
* OSC Switch

NOTE:

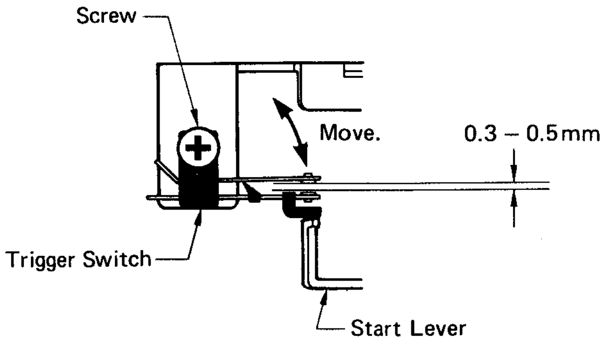
The clearance of the switch contacts should be 0.5 – 1.0mm when the switch is not mounted on the unit. If not, adjust the clearance by carefully bending the contacts.



1. Trigger Switch

This switch works as a trigger to make the mechanism function. When one of the select buttons (except for the Record button) is pressed, the trigger switch is turned on by the Start Lever, so that the Motor starts rotating. After that, this switch is turned off when the mechanism has completely finished its function.

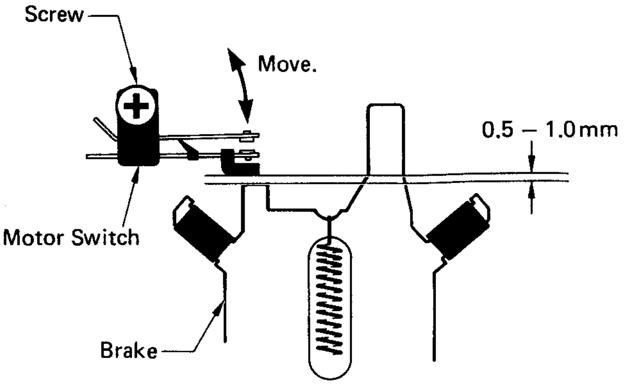
* Check that the Trigger Switch touches the Start Lever and the clearance of the switch contacts is 0.3 – 0.5mm.



2. Motor Switch

This switch is connected in parallel to the Trigger Switch. The driving motor rotates the Flywheel and the rotational force transfered by the Actuate Gear makes the mechanism function. Then, the motor switch is turned on by the brake.

* Check that the clearance between the Motor Switch and Brake is 0.5 – 1.0mm.

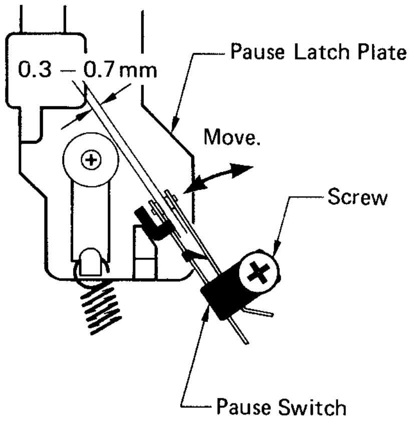


MECHANICAL ADJUSTMENTS (Continued)

3. Pause Switch

This switch is used to light the LED which indicates the pause mode and is turned on or off by the Pause Latch Plate when the Pause button is pressed.

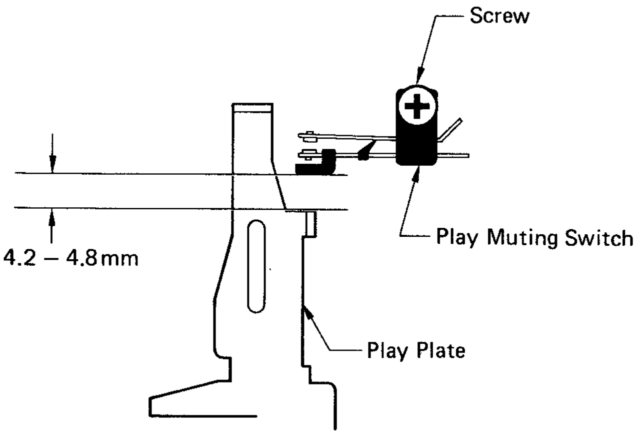
* Check that the clearance of the switch contacts is 0.3 – 0.7 mm with the Pause Switch in contact with the Pause Latch Plate as illustrated.


0.3 – 0.7 mm
Pause Latch Plate
Move.
Screw
Pause Switch

4. Muting Switch

This switch is turned on by the Play Plate when the unit is set in the recording or playback mode, and it turns off the muting circuit.

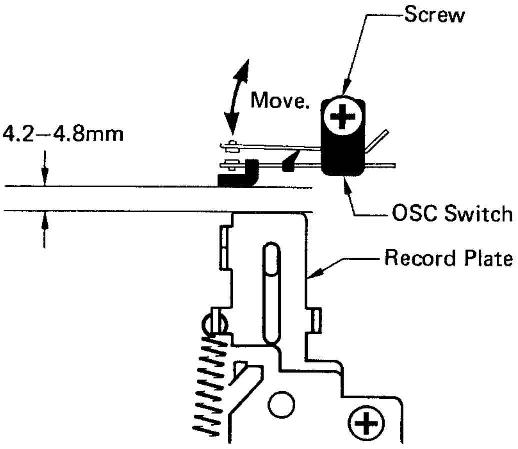
* Check that the clearance between the Play Muting Switch and the Play Plate is 4.2 – 4.8 mm as illustrated.


Screw
4.2 – 4.8 mm
Play Muting Switch
Play Plate

5. OSC Switch

This switch is turned on by the Record Plate when the unit is set in the recording mode, turns on the OSC circuit, and lights up the LED indicating the record mode.

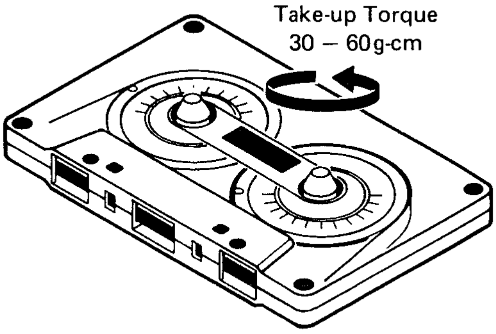
* Check that the clearance between the OSC Switch and the Record Plate is 4.2 – 4.8 mm as illustrated.


Screw
Move.
4.2–4.8mm
OSC Switch
Record Plate

Take-up Torque

1. Insert a cassette-type torquemeter (100g-cm) into the cassette compartment and set the unit in the playback mode. Then, check that the take-up torque is 30 – 60g-cm.

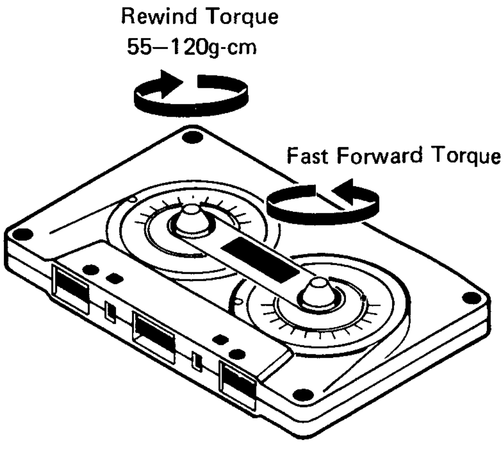
2. If not, replace the Friction with a new one.


Take-up Torque
30 – 60g-cm

Cassette-type Torquemeter

F.FWD and Rewind Torques

1. Insert a cassette-type torquemeter into the cassette compartment and measure the fast forward and rewind torques. Check that each torque is 55 – 120g-cm.


Rewind Torque
55–120g-cm
Fast Forward Torque

MECHANICAL ADJUSTMENTS (Continued)

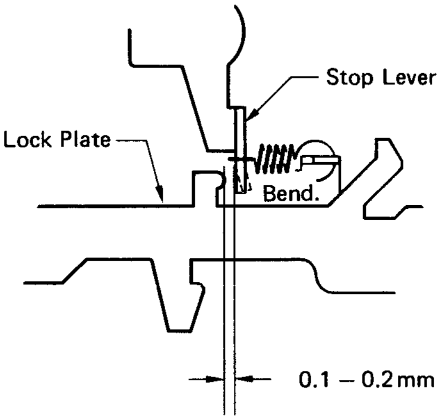
2. If more than the specified torque is obtained, apply a little amount of silicone grease (Example: KS-64) into the groove of the belt engaged in the Fast Wind Gear, rotate the Fast Wind Gear, and apply silicone grease to the Wind Belt.

3. If less than the specified torque is obtained, replace the Wind Belt with a new one and apply a little amount of silicone grease (Example: KS-64) to the Wind Belt in the same manner as in item 2.

Mulfunction of Automatic Shut-off Mechanism

1. If the unit is set in the stop mode while the tape is running, check that the clearance between the Stop Lever and the Lock Plate is 0.1 – 0.2mm as illustrated.

2. If necessary, adjust the clearance by bending the Stop Lever as illustrated.

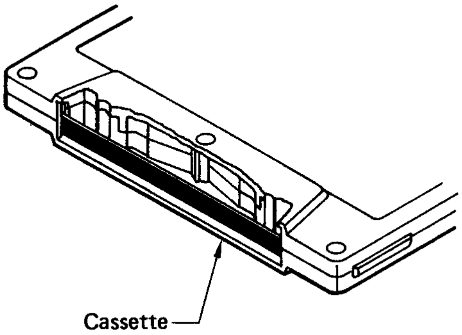


3. When the unit still mulfunctions after the above adjustment, replace the Take-up Reel with a new one.

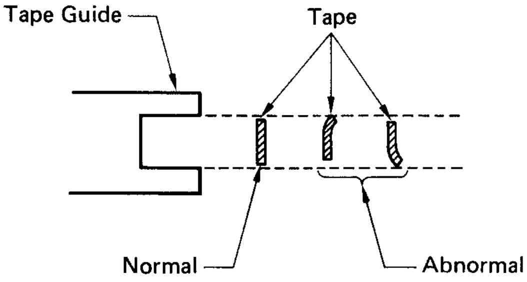
Tape Running Condition Adjustment

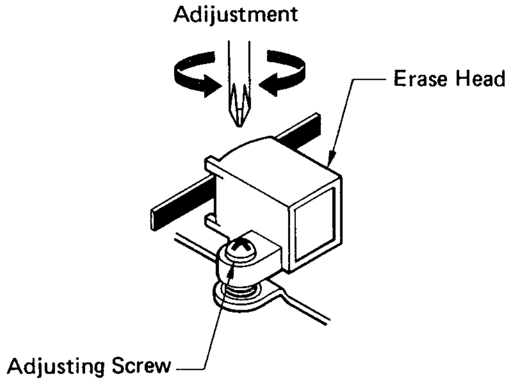
Whenever the Erase Head has been removed or replaced, perform the tape running condition adjustment as follows:

1. Cut the cassette half (Example: TDK C-120) as illustrated and use it for the adjustment.



2. Insert the cassette half into the cassette compartment. Then, turn the adjusting screw while the tape is running, so that the tape does not curl along the Tape Guide of the Erase Head as illustrated.





3. If necessary, adjust the screw until the tape is exactly centered in the Tape Guide of the Erase Head.

4. After the adjustment, secure the adjusting screw with paint or glue.

ELECTRICAL ADJUSTMENTS

EQUIPMENT REQUIRED

- VTVM (2 sets)
- Frequency Counter
- Attenuator
- Dummy Load (47k-ohm)
- Audio Signal Generator
- Dualtrace Synchroscope
- Test Tapes
  - * 3kHz Test Tape (Example: TEAC MTT-111) for Tape Speed Adjustment
  - * 10kHz Test Tape (Example: TEAC MTT-114) for Head Azimuth Adjustment
  - * Test Tape for Dolby Calibration Level (Example: TEAC MTT-150) in Playback Sensitivity Adjustment
- Test Tapes for Recording and Playback Operations
  - * Chromium Dioxide Tape (Example: TDK AC-512)
  - * Metal Tape (Example: TDK AC-711)
- Alignment Tool

Before the Electrical Adjustment, set the unit and measuring instruments as follows:

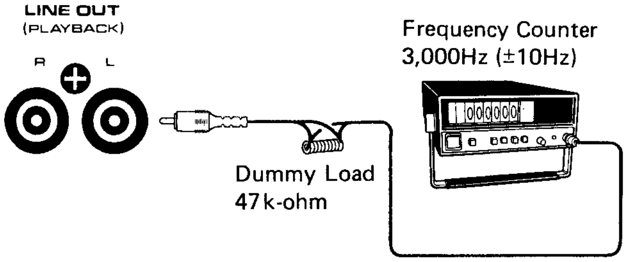
* Input Select Switch . . . . LINE
* Tape Select Switch . . . . NORMAL
* Dolby NR Switch . . . . OFF
* Input Level Control . . . . Maximum
* Audio Signal Generator Output 1kHz 0dB, 1V

NOTE:
Perform the adjustments in the order as described in this manual.

TAPE SPEED ADJUSTMENT

1. Remove the Cover from the unit and connect the frequency counter to the left or right channel LINE OUT as illustrated. Then, insert a 3kHz test tape (Example: TEAC MTT-111) into the cassette holder.

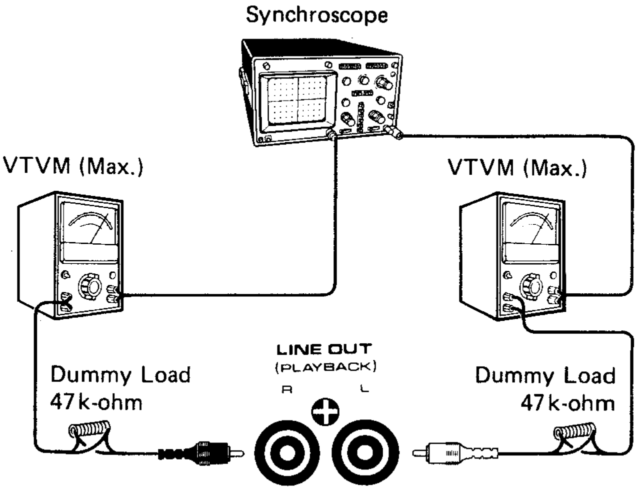
2. While playing back the test tape, adjust the tape speed by turning the potentiometer inside the Motor until the frequency counter reads 3kHz (±10Hz).



HEAD AZIMUTH ADJUSTMENT

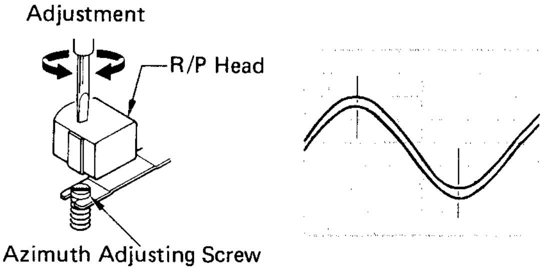
1. Remove the Cassette Lid from the unit. Then, connect the dualtrace synchroscope and the VTVM to the both channel LINE OUT as illustrated and then, set the dualtrace synchroscope as follows:
   * MODE . . . . CHOP (chopped)
   * SOURCE . . . . INT. (internal), CH1 or CH2
   * SWEEP MODE . . . . Auto (automatic)

   NOTE:
   Adjust the field on the synchroscope with the VOL. ADJ and TIME ADJ.



2. Insert a 10kHz test tape (Example: TEAC MTT-114) into the cassette holder and set the unit in the playback mode.

3. While playing back the test tape, slowly turn the azimuth adjusting screw until the amplitudes of the right and left channel signal wave forms are superimposed. Set to optimum at maximum reading of the VTVMs.

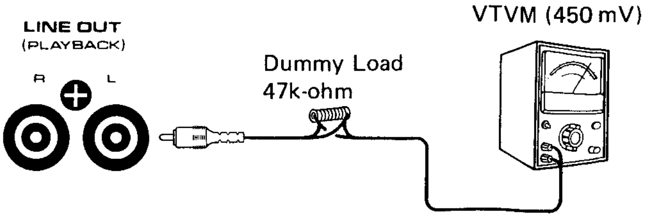


4. After the adjustment, secure the azimuth adjusting screw with paint or glue.

PLAYBACK SENSITIVITY ADJUSTMENT

LEFT CHANNEL

1. Connect the VTVM to the left channel LINE OUT as illustrated and insert a test tape for DOLBY Calibration Level (Example: TEAC MTT-150) into the cassette holder.



2. While playing back the test tape, adjust the potentiometer (P101) until the playback signal output becomes 450mV on the VTVM.

RIGHT CHANNEL

Connect the VTVM to the right channel LINE OUT and adjust the potentiometer (P201) for the right channel by following the same procedure as in LEFT CHANNEL.

ELECTRICAL ADJUSTMENTS (Continued)

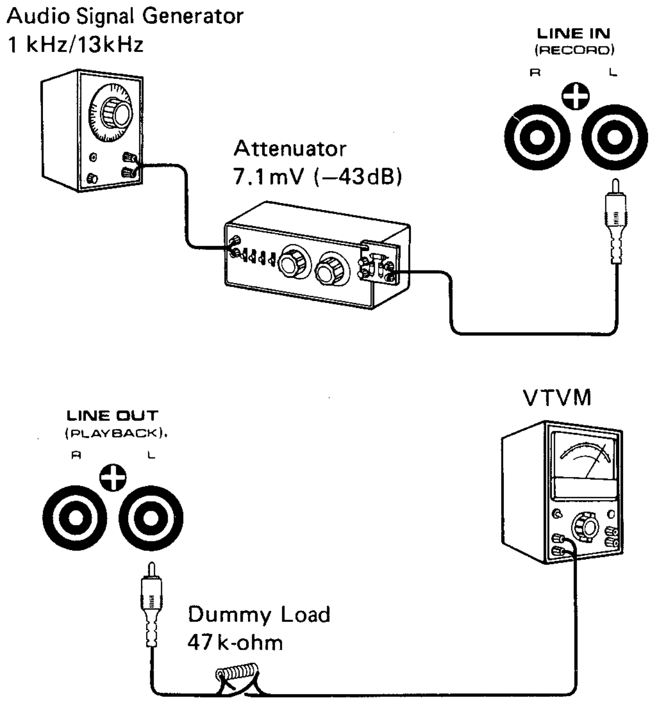
RECORDING BIAS ADJUSTMENT

CHROMIUM DIOXIDE TAPE

Set the Tape Select Switch to "CrO2" and insert a chromium dioxide tape (Example: TDK AC-512) into the cassette holder. Then, perform the adjustment by the following procedures.

LEFT CHANNEL

1. Connect the audio signal generator and the attenuator to the left channel LINE IN, and the VTVM to the left channel LINE OUT as illustrated.



OUTPUT 13kHz = 1kHz, ±1dB

2. Set the unit in the recording mode and feed the signals of 1kHz and 13kHz from the audio signal generator at 7.1mV (−43dB). Then, alternately record them on the tape several times.

3. While playing back the recorded signals, check that the 13kHz signal output is identical to the 1kHz signal output or the deviation is ±1dB on the VTVM.

4. If necessary, adjust the potentiometer (P103) and re-check the output of each signal by playing back the signals after recording operation for the signals.

5. Repeat the above adjustment until the specified output is obtained.

RIGHT CHANNEL

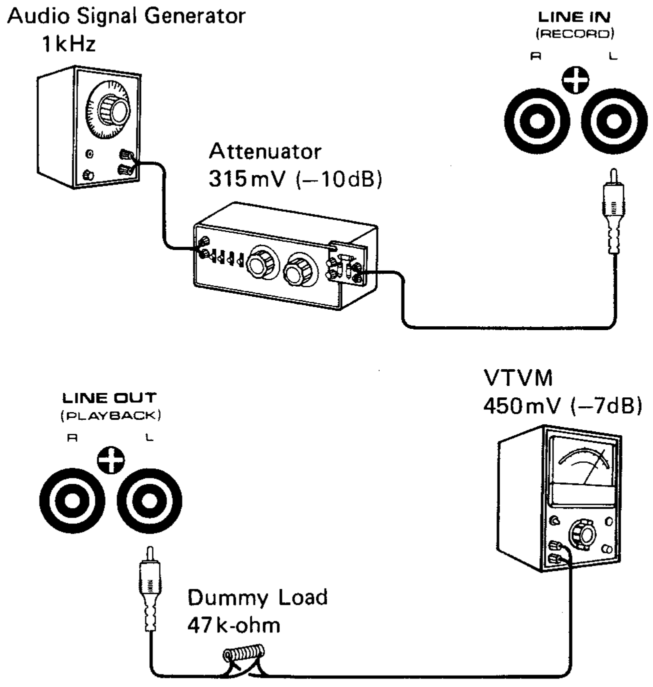
Connect the audio signal generator and the attenuator to the right channel LINE IN, and the VTVM to the left channel LINE OUT as illustrated. Then, adjust the potentiometer (P203) for the right channel by following the same procedures as LEFT CHANNEL.

RECORDING & PLAYBACK SENSITIVITY ADJUSTMENT

Set the Tape Select Switch to "METAL" and insert a metal tape (Example: TDK AC-711) into the cassette holder. Then, perform the adjustment by the following procedures.

LEFT CHANNEL

1. Connect the audio signal generator and the attenuator to the left channel LINE IN, and the VTVM to the left channel LINE OUT as illustrated.



2. Set the unit in the record stand-by mode by pressing the Pause button first, and the Record and Play buttons simultaneously.

3. Feed a 1kHz signal from the audio signal generator at 315mV (−10dB) into the unit and adjust the left channel Input Level Control until the VTVM reads 450mV (−7dB). Then, record the signal on the tape by releasing the Pause button.

4. While playing back the recorded signal, check that the output level is 450mV (±1dB) on the VTVM.

5. If necessary, adjust the potentiometer (P102) and re-check the reading of the VTVM by playing back the recorded signal after the recording operation for the signal.

6. Repeat the above adjustment until the specified output is obtained.

RIGHT CHANNEL

Connect the audio signal generator and the attenuator to the right channel LINE IN, and the VTVM to the right channel LINE OUT. Then, adjust the right channel Input Level Control and the potentiometer (P202) for the right channel by following the same procedures as LEFT CHANNEL.

PARTS LIST

PRODUCT SAFETY NOTICE

PRODUCT SAFETY SHOULD BE CONSIDERED WHEN A COMPONENT REPLACEMENT IS MADE IN ANY AREA OF AN UNIT. COMPONENTS INDICATED BY A MARK ⚠ IN THIS PARTS LIST AND THE SCHEMATIC DIAGRAM SHOW COMPONENTS WHOSE VALUE HAS SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. IT IS PARTICULARLY RECOMMENDED THAT ONLY PARTS SPECIFIED ON THE FOLLOWING PARTS LIST BE USED FOR COMPONENT REPLACEMENT POINTED OUT BY THE MARK.

Ref. No.	Part No.	Description	Q'ty
PACKAGE			
	141 6 1419 51502	Individual Carton	1
	141 6 1449 69600	Styrofoam Case	1
	141 6 1449 69700	Styrofoam Case	1
	141 6 1449 72800	Pad	1
	141 6 2519 09790	Poly Cover	1
	141 6 4559 03200	Serial No. Sheet	3
ACCESSORIES			
	4 2369 73350	Patch Cord	2
	141 6 2519 24033	Poly Cover	1
	141 6 4519 19400	Warranty Card	1
	141 6 4729 07400	Caution Label	1
	141 6 4729 07700	Caution Label	1
	131 2 1801 03900	Leg	4
	142 6 4119 17900	Instruction Manual	1
CABINET			
	4 2359 70990	RT Pin Socket	4
	141 0 1119 77502	Completed Front Cabinet	1
	141 0 1249 18100	Cassette Lid Assy	1
	141 2 1119 69900	Cover	1
	141 2 1419 13304	Rating Plate	1
	141 2 1619 86300	Eject Knob	1
	141 2 1619 86400	Select Knob	4
	141 2 1619 86500	Select Knob	2
	141 2 2449 36000	Sheet	1
	141 2 3529 29200	Select Holder Knob	1
	141 2 4729 04100	Lug	1
	103 3 1702 60811	Screw, Bind Hd. Tapping-2 +M2.6x8	4
	103 3 1703 00811	Screw, Bind Hd. Tapping-2 +M3.0x8	1
	103 3 1703 01211	Screw, Bind Hd. Tapping-2 +M3.0x12	7
	103 3 1704 01213	Screw, Bind Hd. Tapping-2 +M4.0x12	4
	141 2 1619 86000	Power Knob	1
	141 2 1619 86100	Switch Knob	4
	141 2 1619 86200	Switch Knob	1
	141 2 1639 43200	Volume Knob	1
	141 2 1639 43300	Volume Knob	1
AMPLIFIER P.C.B. ASSY			
	4 1329 76433	Amplifier P.C.B. Assy	1
	141 2 3229 34100	Shield Plate	1
	141 2 4729 05000	Staple 5	2
	141 2 4729 05800	Staple 15	2
J1	4 2359 73601	Jack 2P (Line In)	1
J2	4 2359 73601	Jack 2P (Line Out)	1
J6	4 2359 71550	DIN Socket (Record/Play)	1
	4 2369 70740	RT Pin	11
CN1	4 2369 71450	Connector 6P	1
CN2	4 2369 71480	Connector 3P	1
CN17	4 2359 75371	Connector 3P Assy	1
S1	4 2319 70598	Slide Switch (Record/Play)	1
S2	4 2319 74830	Push Switch (Record Mute)	1
S3	4 2319 74820	Select Switch	1
C101	CC1 0 2500 KE00C	Ceramic 0.001 μF 50V ±10%	1
C102	CC2 7 1500 KE00C	Ceramic 270 pF 50V ±10%	1
C103	CD4 7 5100 0000V	Electrolytic 4.7 μF 10V	1
C104	CC4 7 1500 KE00C	Ceramic 470 pF 50V ±10%	1
C105	CD1 0 7100 0001V	Electrolytic 100 μF 10V	1
C106	CC5 6 0500 KD00C	Ceramic 56 pF 50V ±10%	1

Ref. No.	Part No.	Description	Q'ty
AMPLIFIER P.C.B. ASSY			
C107	CD4 7 6100 0001V	Electrolytic 47 μF 10V	1
C108	CM3 3 3500 K00SV	Mylar 0.033 μF 50V ±10%	1
C109	CD1 0 6500 0000V	Electrolytic 10 μF 50V	1
C110	CM1 5 3500 K00SV	Mylar 0.015 μF 50V ±10%	1
C111	CD1 0 5100 0000V	Electrolytic 1 μF 10V	1
C113	CD1 0 5500 0000V	Electrolytic 1 μF 50V	1
C114	CC1 0 1500 KE00C	Ceramic 100 pF 50V ±10%	1
C115	CD1 0 7160 0001V	Electrolytic 100 μF 16V	1
C116	CD2 2 7160 0001V	Electrolytic 220 μF 16V	1
C118	CC2 2 2500 KE00C	Ceramic 0.0022 μF 50V ±10%	1
C119	CD1 0 6500 0000V	Electrolytic 10 μF 50V	1
C120	CD1 0 6500 0000V	Electrolytic 10 μF 50V	1
C121	CM4 7 2500 K00SV	Mylar 0.0047 μF 50V ±10%	1
C122	CD1 0 6160 0000V	Electrolytic 10 μF 16V	1
C123	CM5 6 2500 K00SV	Mylar 0.0056 μF 50V ±10%	1
C124	CM2 7 3500 K00SV	Mylar 0.027 μF 50V ±10%	1
C125	CD1 0 6160 0000V	Electrolytic 10 μF 16V	1
C126	CM4 7 3500 K00SV	Mylar 0.047 μF 50V ±10%	1
C127	CA1 0 4100 K000V	Aluminum 0.1 μF 10V ±10%	1
C128	CA3 3 4100 K000V	Aluminum 0.33 μF 10V ±10%	1
C129	CD1 0 6500 0000V	Electrolytic 10 μF 50V	1
C130	CD4 7 4500 0000V	Electrolytic 0.47 μF 50V	1
C131	CD4 7 6100 0001V	Electrolytic 47 μF 10V	1
C132	CD1 0 6500 0000V	Electrolytic 10 μF 50V	1
C133	CA1 0 4100 K000V	Aluminum 0.1 μF 10V ±10%	1
C134	CM1 0 2500 K00SV	Mylar 0.001 μF 50V ±10%	1
C135	CM2 7 2500 K00SV	Mylar 0.0027 μF 50V ±10%	1
C136	CC4 7 1500 KE00C	Ceramic 470 pF 50V ±10%	1
C137	CC1 0 1500 KE00C	Ceramic 100 pF 50V ±10%	1
C138	CD1 0 6500 0000V	Electrolytic 10 μF 50V	1
C139	CD1 0 6500 0000V	Electrolytic 10 μF 50V	1
C140	CD4 7 4500 0000V	Electrolytic 0.47 μF 50V	1
C141	CD4 7 4500 0000V	Electrolytic 0.47 μF 50V	1
C142	CC2 2 1500 KE00C	Ceramic 220 pF 50V ±10%	1
C201	CC1 0 2500 KE00C	Ceramic 0.001 μF 50V ±10%	1
C202	CC2 7 1500 KE00C	Ceramic 270 pF 50V ±10%	1
C203	CD4 7 5100 0000V	Electrolytic 4.7 μF 10V	1
C204	CC4 7 1500 KE00C	Ceramic 470 pF 50V ±10%	1
C205	CD1 0 7100 0001V	Electrolytic 100 μF 10V	1
C206	CC5 6 0500 KD00C	Ceramic 56 pF 50V ±10%	1
C207	CD4 7 6100 0001V	Electrolytic 47 μF 10V	1
C208	CM3 3 3500 K00SV	Mylar 0.033 μF 50V ±10%	1
C209	CD1 0 6500 0000V	Electrolytic 10 μF 50V	1
C210	CM1 5 3500 K00SV	Mylar 0.015 μF 50V ±10%	1
C211	CD1 0 5100 0000V	Electrolytic 1 μF 10V	1
C213	CD1 0 5500 0000V	Electrolytic 1 μF 50V	1
C214	CC1 0 1500 KE00C	Ceramic 100 pF 50V ±10%	1
C215	CD1 0 7160 0001V	Electrolytic 100 μF 16V	1
C216	CD2 2 7160 0001V	Electrolytic 220 μF 16V	1
C218	CC2 2 2500 KE00C	Ceramic 0.0022 μF 50V ±10%	1
C219	CD1 0 6500 0000V	Electrolytic 10 μF 50V	1
C220	CD1 0 6500 0000V	Electrolytic 10 μF 50V	1
C221	CM4 7 2500 K00SV	Mylar 0.0047 μF 50V ±10%	1
C222	CD1 0 6160 0000V	Electrolytic 10 μF 16V	1
C223	CM5 6 2500 K00SV	Mylar 0.0056 μF 50V ±10%	1
C224	CM2 7 3500 K00SV	Mylar 0.027 μF 50V ±10%	1
C225	CD1 0 6160 0000V	Electrolytic 10 μF 16V	1
C226	CM4 7 3500 K00SV	Mylar 0.047 μF 50V ±10%	1
C227	CA1 0 4100 K000V	Aluminum 0.1 μF 10V ±10%	1

PARTS LIST (Continued)

Ref. No.	Part No.	Description	Q'ty
AMPLIFIER P.C.B. ASSY			
C228	CA3 3 4100 K000V	Aluminum 0.33 µF 10V ±10%	1
C229	CD1 0 6500 0000V	Electrolytic 10 µF 50V	1
C230	CD4 7 4500 0000V	Electrolytic 0.47 µF 50V	1
C231	CD4 7 6100 0001V	Electrolytic 47 µF 10V	1
C232	CD1 0 6500 0000V	Electrolytic 10 µF 50V	1
C233	CA1 0 4100 K000V	Aluminum 0.1 µF 10V ±10%	1
C234	CM1 0 2500 K00SV	Mylar 0.001 µF 50V ±10%	1
C235	CM2 7 2500 K00SV	Mylar 0.0027 µF 50V ±10%	1
C236	CC4 7 1500 KE00C	Ceramic 470 pF 50V ±10%	1
C237	CC1 0 1500 KE00C	Ceramic 100 pF 50V ±10%	1
C238	CD1 0 6500 0000V	Electrolytic 10 µF 50V	1
C239	CD1 0 6500 0000V	Electrolytic 10 µF 50V	1
C240	CD4 7 4500 0000V	Electrolytic 0.47 µF 50V	1
C241	CD4 7 4500 0000V	Electrolytic 0.47 µF 50V	1
C242	CC2 2 1500 KE00C	Ceramic 220 pF 50V ±10%	1
C301	CD1 0 7250 0001V	Electrolytic 100 µF 25V	1
C302	CD1 0 7160 0001V	Electrolytic 100 µF 16V	1
C303	CD4 7 4250 0000V	Electrolytic 0.47 µF 25V	1
C304	CC2 2 2500 KE00C	Ceramic 0.0022 µF 50V ±10%	1
C305	CP8 2 2101 J000V	Polypropylene	1
		0.0082 µF 100V ±5%	1
C306	CM2 2 3500 K00SV	Mylar 0.022 µF 50V ±10%	1
C307	CM5 6 2500 K00SV	Mylar 0.0056 µF 50V ±10%	1
C308	CM5 6 2500 K00SV	Mylar 0.0056 µF 50V ±10%	1
C309	CM1 8 3500 K00SV	Mylar 0.018 µF 50V ±10%	1
C315	CD2 2 7160 0001V	Electrolytic 220 µF 16V	1
C316	CD2 2 6250 0000V	Electrolytic 22 µF 25V	1
C317	CD2 2 6160 0000V	Electrolytic 22 µF 16V	1
C318	CM1 0 3500 K00SV	Mylar 0.01 µF 50V ±10%	1
C319	CD1 0 5500 0000V	Electrolytic 1 µF 50V	1
D101	202 5 9110 18820	Diode, 1S188	1
D102	202 5 9110 18820	Diode, 1S188	1
D103	202 5 9530 44810	Diode, DS448	1
D201	202 5 9110 18820	Diode, 1S188	1
D202	202 5 9110 18820	Diode, 1S188	1
D203	202 5 9530 44810	Diode, DS448	1
D302	202 5 9530 44810	Diode, DS448	1
D305	202 5 9530 44810	Diode, DS448	1
D306	202 5 9530 44810	Diode, DS448	1
D307	202 5 9530 44810	Diode, DS448	1
D308	202 5 9530 44810	Diode, DS448	1
D309	202 5 9530 44810	Diode, DS448	1
D310	202 5 9530 44810	Diode, DS448	1
D311	202 5 3210 05120	Diode, GZA5.1U	1
D312	202 5 3210 05120	Diode, GZA5.1U	1
D313	202 5 3210 05120	Diode, GZA5.1U	1
IC101	4 2069 70380	IC, NE646B	1
IC201	4 2069 70380	IC, NE646B	1
L101	4 2729 70290	Coil (33 mH)	1
L102	4 2729 70290	Coil (33 mH)	1
L103	4 2729 70342	DOLBY Filter Coil	1
L201	4 2729 70290	Coil (33 mH)	1
L202	4 2729 70290	Coil (33 mH)	1
L203	4 2729 70342	DOLBY Filter Coil	1
P101	4 2229 72968	Potentiometer (B-20 k ohm)	1
P102	4 2229 72968	Potentiomerer (B-20 k ohm)	1
P103	4 2229 72971	Potentiometer (B-100 k ohm)	1
P201	4 2229 72968	Potentiometer (B-20 k ohm)	1
P202	4 2229 72968	Potentiometer (B-20 k ohm)	1
P203	4 2229 72971	Potentiometer (B-100 k ohm)	1
Q101	203 5 5100 69362	Transistor, 2SC693	1
Q102	203 5 5100 69362	Transistor, 2SC693	1
Q103	203 5 5100 53660	Transistor, 2SC536	1
Q105	203 5 5100 53660	Transistor, 2SC536	1
Q106	203 5 5100 53660	Transistor, 2SC536	1
Q107	203 5 5100 53660	Transistor, 2SC536	1
Q108	203 5 5100 53660	Transistor, 2SC536	1
Q109	203 5 5100 53660	Transistor, 2SC536	1
Q110	203 5 5100 53660	Transistor, 2SC536	1
Q111	203 5 5100 53660	Transistor, 2SC536	1
AMPLIFIER P.C.B. ASSY			
Q112	203 5 5100 69362	Transistor, 2SC693	1
Q113	203 5 5100 53660	Transistor, 2SC536	1
Q114	203 5 5100 53650	Transistor, 2SC536	1
Q115	203 5 5100 53650	Transistor, 2SC536	1
Q116	203 5 5100 53660	Transistor, 2SC536	1
Q201	203 5 5100 69362	Transistor, 2SC693	1
Q202	203 5 5100 69362	Transistor, 2SC693	1
Q203	203 5 5100 53660	Transistor, 2SC536	1
Q205	203 5 5100 53660	Transistor, 2SC536	1
Q206	203 5 5100 53660	Transistor, 2SC536	1
Q207	203 5 5100 53660	Transistor, 2SC536	1
Q208	203 5 5100 53660	Transistor, 2SC536	1
Q209	203 5 5100 53660	Transistor, 2SC536	1
Q210	203 5 5100 53660	Transistor, 2SC536	1
Q211	203 5 5100 53660	Transistor, 2SC536	1
Q212	203 5 5100 69362	Transistor, 2SC693	1
Q213	203 5 5100 53660	Transistor, 2SC536	1
Q214	203 5 5100 53650	Transistor, 2SC536	1
Q215	203 5 5100 53650	Transistor, 2SC536	1
Q216	203 5 5100 53660	Transistor, 2SC536	1
Q301	4 2039 70431	Transistor, 2SC1815	1
Q302	4 2039 70431	Transistor, 2SC1815	1
Q313	203 5 5100 53660	Transistor, 2SC536	1
Q314	203 5 5100 53660	Transistor, 2SC536	1
Q315	203 5 5100 53660	Transistor, 2SC536	1
Q316	203 5 5100 53660	Transistor, 2SC536	1
R101	RD1 0 3251 JM000	Carbon 10 k ohm 1/4W ±5%	1
R102	RD2 7 4251 JM000	Carbon 270 k ohm 1/4W ±5%	1
R103	RD4 7 0251 JM000	Carbon 47 ohm 1/4W ±5%	1
R104	RD2 2 4251 JM000	Carbon 220 k ohm 1/4W ±5%	1
R105	RD1 5 3251 JM000	Carbon 15 k ohm 1/4W ±5%	1
R106	RD1 0 2251 JM000	Carbon 1 k ohm 1/4W ±5%	1
R107	RD1 0 4251 JM000	Carbon 100 k ohm 1/4W ±5%	1
R108	RD1 8 2251 JM000	Carbon 1.8 k ohm 1/4W ±5%	1
R109	RD3 9 2251 JM000	Carbon 3.9 k ohm 1/4W ±5%	1
R110	RD3 9 4251 JM000	Carbon 390 k ohm 1/4W ±5%	1
R111	RD3 9 2251 JM000	Carbon 3.9 k ohm 1/4W ±5%	1
R112	RD1 0 4251 JM000	Carbon 100 k ohm 1/4W ±5%	1
R113	RD3 9 2251 JM000	Carbon 3.9 k ohm 1/4W ±5%	1
R114	RD4 7 2251 JM000	Carbon 4.7 k ohm 1/4W ±5%	1
R115	RD1 0 4251 JM000	Carbon 100 k ohm 1/4W ±5%	1
R116	RD2 2 3251 JM000	Carbon 22 k ohm 1/4W ±5%	1
R117	RD4 7 3251 JM000	Carbon 47 k ohm 1/4W ±5%	1
R118	RD1 0 2251 JM000	Carbon 1 k ohm 1/4W ±5%	1
R119	RD1 5 4251 JM000	Carbon 150 k ohm 1/4W ±5%	1
R121	RD3 3 1251 JM000	Carbon 330 ohm 1/4W ±5%	1
R122	RD1 0 2251 JM000	Carbon 1 k ohm 1/4W ±5%	1
R123	RD1 0 2251 JM000	Carbon 1 k ohm 1/4W ±5%	1
R124	RD1 0 5251 JM000	Carbon 1M ohm 1/4W ±5%	1
R125	RD3 3 3251 JM000	Carbon 33 k ohm 1/4W ±5%	1
R126	RD1 0 3251 JM000	Carbon 10 k ohm 1/4W ±5%	1
R127	RD2 2 3251 JM000	Carbon 22 k ohm 1/4W ±5%	1
R128	RD1 0 3251 JM000	Carbon 10 k ohm 1/4W ±5%	1
R129	RD3 3 2251 JM000	Carbon 3.3 k ohm 1/4W ±5%	1
R130	RD1 8 1251 JM000	Carbon 180 ohm 1/4W ±5%	1
R131	RD4 7 3251 JM000	Carbon 47k ohm 1/4W ±5%	1
R132	RD1 8 4251 JM000	Carbon 180 k ohm 1/4W ±5%	1
R133	RD2 7 4251 JM000	Carbon 270 k ohm 1/4W ±5%	1
R134	RD1 0 2251 JM000	Carbon 1 k ohm 1/4W ±5%	1
R135	RD1 0 2251 JM000	Carbon 1 k ohm 1/4W ±5%	1
R136	RD1 0 3251 JM000	Carbon 10 k ohm 1/4W ±5%	1
R137	RD1 0 3251 JM000	Carbon 10 k ohm 1/4W ±5%	1
R138	RD2 2 2251 JM000	Carbon 2.2 k ohm 1/4W ±5%	1
R139	RD5 6 2251 JM000	Carbon 5.6 k ohm 1/4W ±5%	1
R140	RD1 0 2251 JM000	Carbon 1 k ohm 1/4W ±5%	1
R141	RD2 2 2251 JM000	Carbon 2.2 k ohm 1/4W ±5%	1
R142	RD2 2 3251 JM000	Carbon 22 k ohm 1/4W ±5%	1
R143	RD6 8 2251 JM000	Carbon 6.8 k ohm 1/4W ±5%	1
R144	RD2 2 3251 JM000	Carbon 22 k ohm 1/4W ±5%	1
R145	RD1 0 2251 JM000	Carbon 1 k ohm 1/4W ±5%	1

PARTS LIST (Continued)

Ref. No.	Part No.	Description	Q'ty
AMPLIFIER P.C.B. ASSY			
R146	RD4 3 4251 JM000	Carbon 430 k ohm 1/4W ±5%	1
R147	RD6 2 3251 JM000	Carbon 62 k ohm 1/4W ±5%	1
R148	RD5 6 2251 JM000	Carbon 5.6 k ohm 1/4W ±5%	1
R149	RD7 5 1251 JM000	Carbon 750 ohm 1/4W ±5%	1
R150	RD2 2 3251 JM000	Carbon 22 k ohm 1/4W ±5%	1
R151	RD1 5 3251 JM000	Carbon 15 k ohm 1/4W ±5%	1
R152	RD3 9 3251 JM000	Carbon 39 k ohm 1/4W ±5%	1
R153	RD3 3 1251 JM000	Carbon 330 ohm 1/4W ±5%	1
R154	RD1 0 3251 JM000	Carbon 10 k ohm 1/4W ±5%	1
R155	RD1 0 3251 JM000	Carbon 10 k ohm 1/4W ±5%	1
R156	RD6 8 2251 JM000	Carbon 6.8 k ohm 1/4W ±5%	1
R157	RD1 0 3251 JM000	Carbon 10 k ohm 1/4W ±5%	1
R158	RD8 2 3251 JM000	Carbon 82 k ohm 1/4W ±5%	1
R159	RD8 2 2251 JM000	Carbon 8.2 k ohm 1/4W ±5%	1
R160	RD6 8 1251 JM000	Carbon 680 ohm 1/4W ±5%	1
R161	RD2 7 0251 JM000	Carbon 27 ohm 1/4W ±5%	1
R162	RD5 6 0251 JM000	Carbon 56 ohm 1/4W ±5%	1
R163	RD3 9 2251 JM000	Carbon 3.9 k ohm 1/4W ±5%	1
R164	RD2 2 2251 JM000	Carbon 2.2 k ohm 1/4W ±5%	1
R165	RD1 8 4251 JM000	Carbon 180 k ohm 1/4W ±5%	1
R166	RD2 7 3251 JM000	Carbon 27 k ohm 1/4W ±5%	1
R167	RD3 3 2251 JM000	Carbon 3.3 k ohm 1/4W ±5%	1
R168	RD2 2 1251 JM000	Carbon 220 ohm 1/4W ±5%	1
R169	RD1 1 3251 JM000	Carbon 11 k ohm 1/4W ±5%	1
R171	RD1 0 3251 JM000	Carbon 10 k ohm 1/4W ±5%	1
R172	RD2 2 3251 JM000	Carbon 22 k ohm 1/4W ±5%	1
R173	RD1 0 5251 JM000	Carbon 1M ohm 1/4W ±5%	1
R201	RD1 0 3251 JM000	Carbon 10 k ohm 1/4W ±5%	1
R202	RD2 7 4251 JM000	Carbon 270 k ohm 1/4W ±5%	1
R203	RD4 7 0251 JM000	Carbon 47 ohm 1/4W ±5%	1
R204	RD2 2 4251 JM000	Carbon 220 k ohm 1/4W ±5%	1
R205	RD1 5 3251 JM000	Carbon 15 k ohm 1/4W ±5%	1
R206	RD1 0 2251 JM000	Carbon 1 k ohm 1/4W ±5%	1
R207	RD1 0 4251 JM000	Carbon 100 k ohm 1/4W ±5%	1
R208	RD1 8 2251 JM000	Carbon 1.8 k ohm 1/4W ±5%	1
R209	RD3 9 2251 JM000	Carbon 3.9 k ohm 1/4W ±5%	1
R210	RD3 9 4251 JM000	Carbon 390 k ohm 1/4W ±5%	1
R211	RD3 9 2251 JM000	Carbon 3.9 k ohm 1/4W ±5%	1
R212	RD1 0 4251 JM000	Carbon 100 k ohm 1/4W ±5%	1
R213	RD3 9 2251 JM000	Carbon 3.9 k ohm 1/4W ±5%	1
R214	RD4 7 2251 JM000	Carbon 4.7 k ohm 1/4W ±5%	1
R215	RD1 0 4251 JM000	Carbon 100 k ohm 1/4W ±5%	1
R216	RD2 2 3251 JM000	Carbon 22 k ohm 1/4W ±5%	1
R217	RD4 7 3251 JM000	Carbon 47 k ohm 1/4W ±5%	1
R218	RD1 0 2251 JM000	Carbon 1 k ohm 1/4W ±5%	1
R219	RD1 5 4251 JM000	Carbon 150 k ohm 1/4W ±5%	1
R221	RD3 3 1251 JM000	Carbon 330 ohm 1/4W ±5%	1
R222	RD1 0 2251 JM000	Carbon 1 k ohm 1/4W ±5%	1
R223	RD1 0 2251 JM000	Carbon 1 k ohm 1/4W ±5%	1
R224	RD1 0 5251 JM000	Carbon 1M ohm 1/4W ±5%	1
R225	RD3 3 3251 JM000	Carbon 33 k ohm 1/4W ±5%	1
R226	RD1 0 3251 JM000	Carbon 10 k ohm 1/4W ±5%	1
R227	RD2 2 3251 JM000	Carbon 22 k ohm 1/4W ±5%	1
R228	RD1 0 3251 JM000	Carbon 10 k ohm 1/4W ±5%	1
R229	RD3 3 2251 JM000	Carbon 3.3 k ohm 1/4W ±5%	1
R230	RD1 8 1251 JM000	Carbon 180 ohm 1/4W ±5%	1
R231	RD 47 3251 JM000	Carbon 47 k ohm 1/4W ±5%	1
R232	RD1 8 4251 JM000	Carbon 180 k ohm 1/4W ±5%	1
R233	RD2 7 4251 JM000	Carbon 270 k ohm 1/4W ±5%	1
R234	RD1 0 2251 JM000	Carbon 1 k ohm 1/4W ±5%	1
R235	RD1 0 2251 JM000	Carbon 1 k ohm 1/4W ±5%	1
R236	RD1 0 3251 JM000	Carbon 10 k ohm 1/4W ±5%	1
R237	RD1 0 3251 JM000	Carbon 10 k ohm 1/4W ±5%	1
R238	RD2 2 2251 JM000	Carbon 2.2 k ohm 1/4W ±5%	1
R239	RD5 6 2251 JM000	Carbon 5.6 k ohm 1/4W ±5%	1
R240	RD1 0 2251 JM000	Carbon 1 k ohm 1/4W ±5%	1
R241	RD2 2 2251 JM000	Carbon 2.2 k ohm 1/4W ±5%	1
R242	RD2 2 3251 JM000	Carbon 22 k ohm 1/4W ±5%	1
R243	RD6 8 2251 JM000	Carbon 6.8 k ohm 1/4W ±5%	1
R244	RD2 2 3251 JM000	Carbon 22 k ohm 1/4W ±5%	1

Ref. No.	Part No.	Description	Q'ty
AMPLIFIER P.C.B. ASSY			
R245	RD1 0 2251 JM000	Carbon 1 k ohm 1/4W ±5%	1
R246	RD4 3 4251 JM000	Carbon 430 k ohm 1/4W ±5%	1
R247	RD6 2 3251 JM000	Carbon 62 k ohm 1/4W ±5%	1
R248	RD5 6 2251 JM000	Carbon 5.6 k ohm 1/4W ±5%	1
R249	RD7 5 1251 JM000	Carbon 750 ohm 1/4W ±5%	1
R250	RD2 2 3251 JM000	Carbon 22 k ohm 1/4W ±5%	1
R251	RD1 5 3251 JM000	Carbon 15 k ohm 1/4W ±5%	1
R252	RD3 9 3251 JM000	Carbon 39 k ohm 1/4W ±5%	1
R253	RD3 3 1251 JM000	Carbon 330 ohm 1/4W ±5%	1
R254	RD1 0 3251 JM000	Carbon 10 k ohm 1/4W ±5%	1
R255	RD1 0 3251 JM000	Carbon 10 k ohm 1/4W ±5%	1
R256	RD6 8 2251 JM000	Carbon 6.8 k ohm 1/4W ±5%	1
R257	RD1 0 3251 JM000	Carbon 10 k ohm 1/4W ±5%	1
R258	RD8 2 3251 JM000	Carbon 82 k ohm 1/4W ±5%	1
R259	RD8 2 2251 JM000	Carbon 8.2 k ohm 1/4W ±5%	1
R260	RD6 8 1251 JM000	Carbon 680 ohm 1/4W ±5%	1
R261	RD2 7 0251 JM000	Carbon 27 ohm 1/4W ±5%	1
R262	RD5 6 0251 JM000	Carbon 56 ohm 1/4W ±5%	1
R263	RD3 9 2251 JM000	Carbon 3.9 k ohm 1/4W ±5%	1
R264	RD2 2 2251 JM000	Carbon 2.2 k ohm 1/4W ±5%	1
R265	RD1 8 4251 JM000	Carbon 180 k ohm 1/4W ±5%	1
R266	RD2 7 3251 JM000	Carbon 27 k ohm 1/4W ±5%	1
R267	RD3 3 2251 JM000	Carbon 3.3 k ohm 1/4W ±5%	1
R268	RD2 2 1251 JM000	Carbon 220 ohm 1/4W ±5%	1
R269	RD1 1 3251 JM000	Carbon 11 k ohm 1/4W ±5%	1
R271	RD1 0 3251 JM000	Carbon 10 k ohm 1/4W ±5%	1
R272	RD2 2 3251 JM000	Carbon 22 k ohm 1/4W ±5%	1
R273	RD1 0 5251 JM000	Carbon 1M ohm 1/4W ±5%	1
R301	RH3 3 1501 KZ000	Metal 330 ohm 1/2W ±10%	1
R302	RH3 9 1501 KZ000	Metal 390 ohm 1/2W ±10%	1
R303	RD3 9 3251 JM000	Carbon 39 k ohm 1/4W ±5%	1
R304	RD3 9 3251 JM000	Carbon 39 k ohm 1/4W ±5%	1
R305	RD1 0 0251 JM000	Carbon 10 ohm 1/4W ±5%	1
R328	RD2 7 2251 JM000	Carbon 2.7 k ohm 1/4W ±5%	1
R329	RD6 8 2251 JM000	Carbon 6.8 k ohm 1/4W ±5%	1
R330	RD2 2 2251 JM000	Carbon 2.2 k ohm 1/4W ±5%	1
R331	RD3 3 3251 JM000	Carbon 33 k ohm 1/4W ±5%	1
R333	RD3 3 4251 JM000	Carbon 330 k ohm 1/4W ±5%	1
R334	RD2 7 2251 JM000	Carbon 2.7 k ohm 1/4W ±5%	1
R335	RD2 2 2251 JM000	Carbon 2.2 k ohm 1/4W ±5%	1
R336	RD1 2 3251 JM000	Carbon 12 k ohm 1/4W ±5%	1
R337	RD3 3 3251 JM000	Carbon 33 k ohm 1/4W ±5%	1
R338	RD2 2 3251 JM000	Carbon 22 k ohm 1/4W ±5%	1
R340	RD1 5 2251 JM000	Carbon 1.5 k ohm 1/4W ±5%	1
R342	RD1 5 2251 JM000	Carbon 1.5 k ohm 1/4W ±5%	1
R343	RD5 6 2251 JM000	Carbon 5.6 k ohm 1/4W ±5%	1
T2	4 2589 71720	OSC Transformer	1
POWER SUPPLY P.C.B. ASSY			
	4 1329 76451	Power Supply P.C.B. Assy	1
F1	⚠ 4 2349 70040	Fuse (500 mA)	1
F2	⚠ 4 2359 70040	Fuse (500 mA)	1
	4 2359 70910	Fuse Holder	4
	101 3 1303 00811	Screw, Pan Hd. +M3.0x8	1
	106 3 1103 00011	Nut-1 M3.0	1
	141 2 3689 03000	Transistor Bracket (for Q501)	1
C501	CC2 2 3500 KE00C	Ceramic 0.022 μF 50V ±10%	1
C502	CC2 2 3500 KE00C	Ceramic 0.022 μF 50V ±10%	1
C503	CD1 0 8350 0001V	Electrolytic 1000 μF 35V	1
C504	CD4 7 7250 0001V	Electrolytic 470 μF 25V	1
C505	CC1 0 3500 KE00C	Ceramic 0.01 μF 50V ±10%	1
C506	CD4 7 7250 0001V	Electrolytic 470 μF 25V	1
C507	CD2 2 8160 0001V	Electrolytic 2200 μF 16V	1
D501	202 5 3210 20020	Diode, GZA20U	1
D503	4 2029 70620	Bridge Diode	1
D504	202 5 2450 13520	Diode, DS135	1
Q501	4 2039 70601	Transistor, 2SC1846	1
R501	RD3 3 A251 JM000	Carbon 3.3 ohm 1/4W ±5%	1
R502	RD3 3 1251 JM000	Carbon 330 ohm 1/4W ±5%	1
R503	RD5 6 A251 JM000	Carbon 5.6 ohm 1/4W ±5%	1
R504	RD1 0 2251 JM000	Carbon 1 k ohm 1/4W ±5%	1

PARTS LIST (Continued)

Ref. No.	Part No.	Description	Q'ty
CONNECTOR P.C.B. ASSY			
	4 1329 76561	Connector P.C.B. Assy	1
CN17	4 2369 71561	Connector 3P	1
	4 2379 70650	Ring Terminal	1
D502	202 5 2450 13520	Diode, DS135	1
	4 2269 34730	Control P.C.B.	1
VOLUME P.C.B. ASSY			
	4 1329 76950	Volume P.C.B. Assy	1
VR1	4 2229 71765	Volume Control (Input Level, A-50k)	1
	4 2269 34570	Volume P.C.B.	1
MICROPHONE JACK P.C.B. ASSY			
	4 1329 76960	Microphone Jack P.C.B. Assy	1
	4 2269 34591	Microphone P.C.B.	1
J4	4 2359 75311	Jack 1P (Microphone)	1
J5	4 2359 75311	Jack 1P (Microphone)	1
HEADPHONE JACK P.C.B. ASSY			
	4 1329 76970	Headphone Jack P.C.B. Assy	1
	4 2269 34580	Headphone P.C.B.	1
J3	4 2359 75310	Jack 1P (Headphones)	1
INDICATOR P.C.B. ASSY			
	4 1329 76990	Indicator P.C.B. Assy	1
	4 2269 34620	Select Button P.C.B.	1
D317	4 2029 71160	LED, SLP-151B (Record)	1
D318	4 2029 71160	LED, SLP-151B (Pause)	1
D319	4 2029 71150	LED, SLP-251B (Play)	1
MECHANISM			
S4	⚠ 4 2319 73970	Power Switch	1
S5	4 2319 74360	Leaf Switch (Pause)	1
S6	4 2319 74362	Leaf Switch (Trigger)	1
S7	4 2319 74360	Leaf Switch (Muting)	1
S8	4 2319 74360	Leaf Switch (Motor)	1
S9	4 2319 74360	Leaf Switch (OSC)	1
S11	⚠ 4 2319 72140	Slide Switch (Voltage Select)	1
	4 2359 70990	RT Pin Socket	8
CN1	4 2359 75136	Connector 6P Assy	1
CN2	4 2359 75248	Connector 3P Assy	1
	⚠ 4 2379 70560	Terminal	1
	4 2379 70650	Ring Terminal	1
HD1	4 2429 71670	R/P Head	1
HD2	4 2429 71710	Erase Head	1
	⚠ 4 2439 70352	Power Cord	1
T1	⚠ 4 2519 73490	Power Transformer	1
ME1	4 5119 70645	Indicator (Meter)	1
M1	4 5279 71062	Motor	1
PL1	4 6129 70480	Lamp (Meter)	1
	141 0 3119 19300	Chassis Assy	1
	141 0 3519 19300	Record Bracket Assy	1
	141 0 5219 07500	Flywheel Assy	1
	141 0 5319 05700	Take-up Reel Assy	1
	141 0 5419 02400	Pinch Roller Assy	1
	141 0 5519 07900	Eject Gear Assy	1
	141 0 5519 08000	Friction Assy	1
	14 10 7319 22200	Power Plate Assy	1
	141 0 7419 28700	Fast Wind Lever Assy	1
	141 0 7439 09500	Rewind Arm Assy	1
	141 0 7439 09600	Take-up Arm Assy	1
	141 2 1149 22801	Cabinet Compartment	1
	141 2 1149 23600	Chassis Panel	1
	141 2 1219 18301	Meter Plate	1
	141 2 1249 25400	Cassette Lid Frame	1
	141 2 1519 12202	Reflection	1
	141 2 1619 68700	Reset Button	1
	141 2 1619 78201	Stop Plate Button	4
	141 2 1619 78301	Play Plate Button	2
	141 2 3119 14601	Cabinet Chassis	1
	141 2 3519 52300	Flywheel Support	1

Ref. No.	Part No.	Description	Q'ty
MECHANISM			
	141 2 3519 57200	Support	1
	141 2 3719 05500	Fix Transformer	2
	141 2 3779 18900	Support P.C.B.	1
	141 2 3899 10400	Heyco Bushing	1
	141 2 4219 05400	Screw Washer	2
	141 2 4219 13201	Screw Washer	5
	141 2 4219 17900	Screw, Pan Hd. +M2.6x2.7	2
	141 2 4219 22600	Screw Poly Wave	3
	141 2 4219 23000	Screw	2
	141 2 4219 24700	Screw, Pan Hd. Tapping-2 +M2.6x12	5
	141 2 4459 25800	Brake Cover	2
	141 2 4469 22000	Cushion	4
	141 2 4539 06900	Washer	1
	141 2 4539 27100	Washer	1
	141 2 4629 01000	Joint	1
	141 2 4729 04100	Lug	1
	141 2 4729 04200	Lug	1
	141 2 5319 05300	Reel Fin	1
	141 2 5319 10300	Supply Reel Gear	1
	141 2 5369 00400	Cap, Reel Plate	2
	141 2 5519 38200	Idler Gear	1
	141 2 5519 38600	Take-up Gear	1
	141 2 5519 38700	Fast Wind Gear	1
	141 2 5519 38800	Pulley Idler Gear	1
	141 2 5519 38900	Auto Shut-off Gear	1
	141 2 5519 39000	Actuate Gear	1
	141 2 5619 01400	Drive Belt	1
	141 2 5649 16800	Wind Belt	1
	141 2 5649 16900	Auto Shut-off Belt	1
	141 2 5649 17300	Counter Belt	1
	141 2 5739 06100	Flywheel Thrust	1
	141 2 6139 14100	Button Frame	1
	141 2 6139 14200	Plate Frame	1
	141 2 7149 05000	Brake	1
	141 2 7319 43500	Pause Plate	1
	141 2 7319 43600	Fast Wind Plate	1
	141 2 7319 43700	Stop Plate	1
	141 2 7319 43800	Play Plate	1
	141 2 7319 43900	Rewind Plate	1
	141 2 7319 44000	Record Plate	1
	141 2 7319 44100	Slide Base	1
	141 2 7319 44600	Latch Pause Plate	1
	141 2 7319 44700	Select Plate	1
	141 2 7319 44800	Eject Plate	1
	141 2 7319 46600	Lock Plate	1
	141 2 7419 70500	Start Lever	1
	141 2 7419 70600	Stop Lever	1
	141 2 7419 70700	Review Lever	1
	141 2 7419 71000	Stop Button Plate Lever	1
	141 2 7419 71100	Auto Shut-off Lever	1
	141 2 7419 71200	Eject Lock Lever	1
	141 2 7419 71300	Record Stop Lever	1
	141 2 7419 71400	Cassette Lid Lock	1
	141 2 7419 71500	Eject Lever	1
	141 2 7419 71600	Pause Lever	1
	141 2 7419 72700	Stop Lever, Auto Shut-off	1
	141 2 7419 73100	Spring, Record Lever	1
	141 2 7419 77300	Record Lever	1
	141 2 7539 00500	Pin	6
	141 2 8119 07101	Counter	1
	141 2 8139 06700	Counter Bracket	1
	141 2 8259 08900	Roller Plate	2
	141 2 8429 05700	Interlock Plate	1
	141 2 8519 19300	Spring, Brake	1
	141 2 8519 39300	Spring, Slide Base	1
	141 2 8519 41300	Spring, Lock Lever	3
	141 2 8519 67901	Spring, Supply Reel	1
	141 2 8519 74300	Spring, Azimuth	1
	141 2 8539 36700	Spring, Earth	1
	141 2 8539 39700	Spring, Cassette	1

PARTS LIST (Continued)

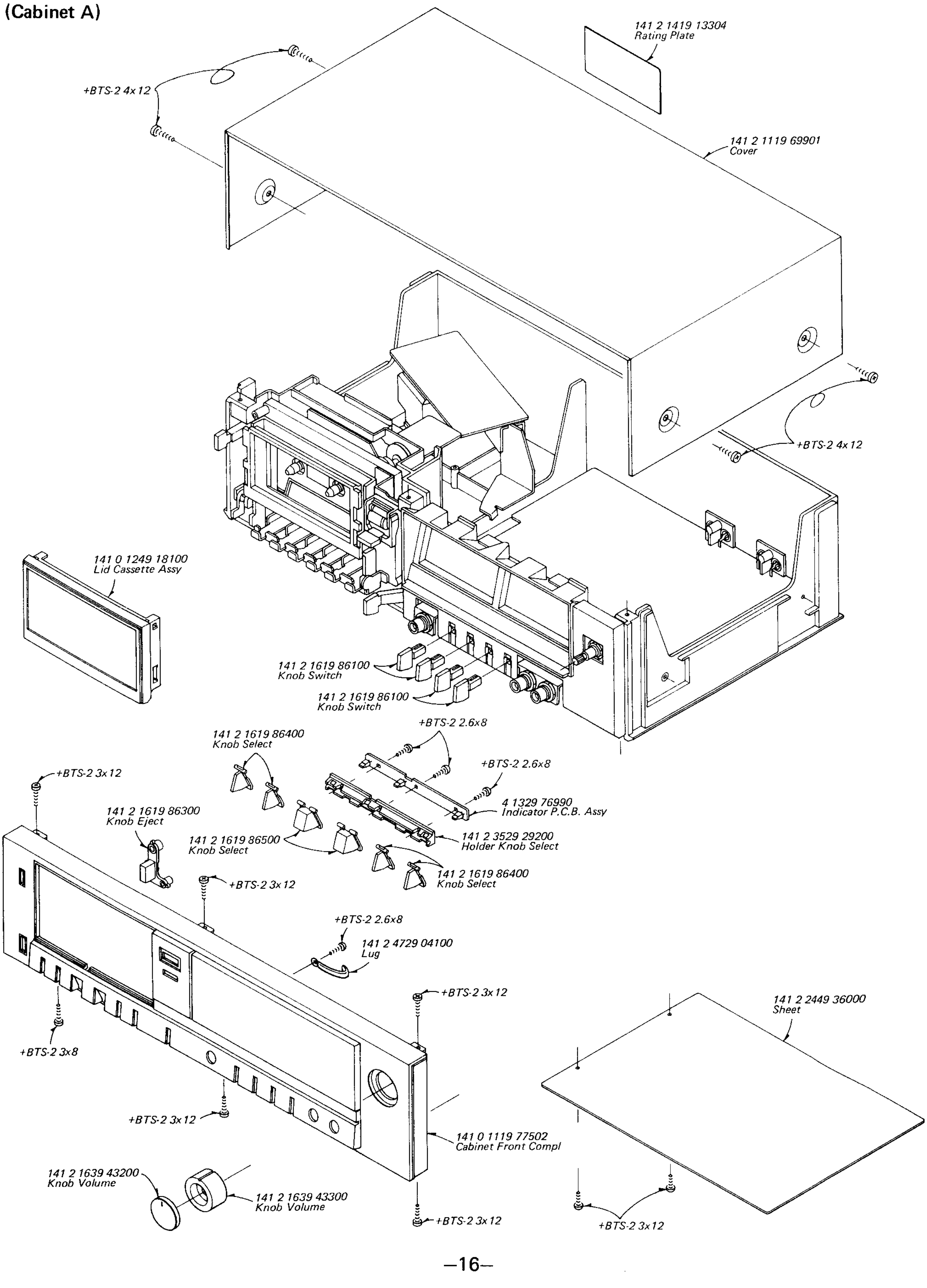
Ref. No.	Part No.	Description	Q'ty
MECHANISM			
	141 2 8539 39800	Spring, Base	1
	141 2 8539 41300	Spring, Eject Plate	1
	141 2 8539 42600	Spring, Earth	1
	141 2 8549 00500	Spring, Pin	6
	141 2 8549 00700	Spring, Brake	3
	141 2 8549 00800	Spring, Plate	3
	141 2 8549 00900	Spring, Play Plate	1
	141 2 8549 01000	Spring, Record Plate	1
	141 2 8549 01100	Spring, Take-up Arm	2
	141 2 8549 01200	Spring, Rewind Arm	1
	141 2 8549 01300	Spring, Record Stop	1
	141 2 8549 01400	Spring, Auto Shut-off Pause	1
	141 2 8549 01500	Spring, Pinch Roller	1
	141 2 8549 01600	Spring, Cassette Lid Lock	1
	141 2 8549 01700	Spring, Cassette Up Lid	1
	141 2 8549 01800	Spring, Pause Lock	1
	141 2 8549 01900	Spring, Slide Base	1
	141 2 8549 02000	Spring, Start Lever	1
	141 2 8549 02200	Spring, Start	1
	141 2 8549 03400	Spring, Button Plate	5
	141 2 8549 03401	Spring, Play Button	1
	141 2 8549 04400	Spring, Interlock	2
	141 2 8549 04800	Spring, R/P Switch	1
	141 2 8549 07500	Spring, F.F. Plate	1
	141 2 8559 00200	Spring, Erase Head	1
	141 2 4729 34300	Motor Label	1
	101 3 1702 00411	Screw, Bind Hd. +M2.0x4	1
	101 3 1702 00618	Screw, Bind Hd. +M2.0x6	2
	101 3 1702 00811	Screw, Bind Hd. +M2.0x8	1
	101 3 2502 01011	Screw, Cylinder Hd. -M2.0x10	1
	102 3 1703 01218	Screw, Bind Hd. Tapping-1 +M3.0x12	2
	103 3 1302 00611	Screw, Pan Hd. Tapping-2 +M2.0x6	2
	103 3 1302 60611	Screw, Pan Hd. Tapping-2 +M2.6x6	1
	103 3 1702 00711	Screw, Bind Hd. Tapping-2 +M2x7	1
	103 3 1702 00818	Screw, Bind Hd. Tapping-2 +M2.0x8	2
	103 3 1703 01211	Screw, Bind Hd. Tapping-2 +M3.0x12	5
	110 3 1202 00013	Finished Washer M2.0	1
	110 3 9210 50024	Washer M2.1x5.0x0.2	4
	110 3 9260 80024	Washer M2.6x8.0x0.2	2
	110 3 9310 60025	Washer M3.0x6.0x0.2	1
	110 3 9321 00102	Washer M3.2x10.0x1.0	5
	112 3 1301 50082	E Ring M1.5	9
	112 3 1302 00082	E Ring M2.0	2
	131 3 1303 00811	Screw, Pan Hd. C SW +M3.0x8	2
	143 3 1302 60611	Screw, Pan Hd. Tapping-B +M2.6x6	4
	143 3 1302 60811	Screw, Pan Hd. Tapping-B +M2.6x8	9
	143 3 1303 00811	Screw, Pan Hd. Tapping-B +M3.0x8	4
	143 3 1303 01811	Screw, Pan Hd. Tapping-B +M3.0x18	1
	143 3 1303 02011	Screw, Pan Hd. Tapping-B +M3.0x20	4
	143 3 1702 60818	Screw, Bind Hd. Tapping-B +M2.6x8	5
	143 3 1903 00811	Screw, Brazier Hd. Tapping-B +M3.0x8	2
	143 3 1903 01011	Screw, Brazier Hd. Tapping-B +M3.0x10	2
	143 3 1903 01211	Screw, Brazier Hd. Tapping-B +M3.0x12	5
C508	CD2 2 7160 0001V	Electrolytic 220 µF 16V	1
	141 2 3679 29400	Jack Bracket	1
	131 31 303 00611	Screw, Pan Hd. C SW +M3.0x6	3

NOTES: 1. Parts order must contain Model Number, Part Number and Description.

2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

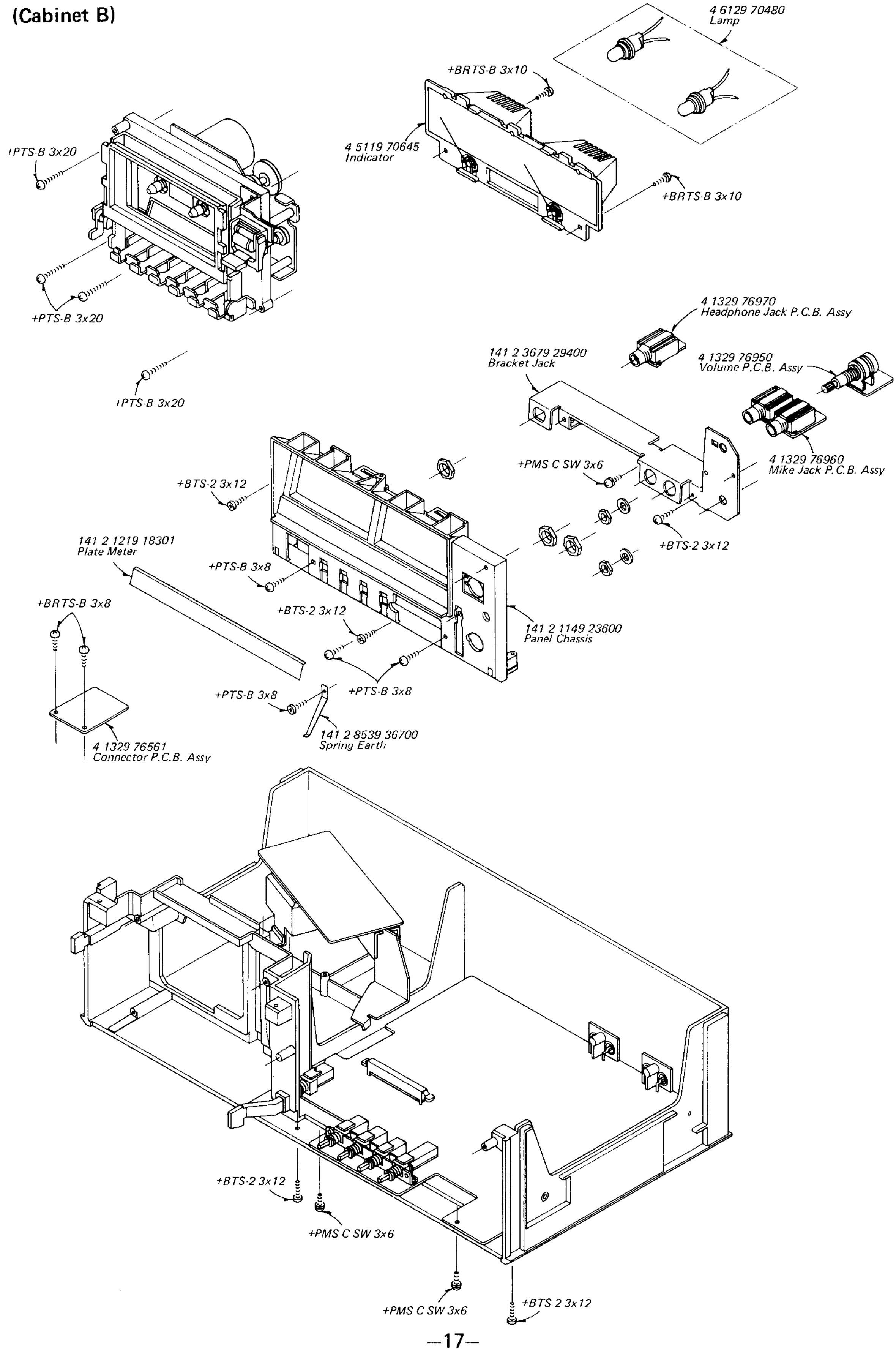
EXPLODED VIEW

(Cabinet A)


141 2 1419 13304
Rating Plate
+BTS-2 4x12
141 2 1119 69901
Cover
+BTS-2 4x12
141 0 1249 18100
Lid Cassette Assy
141 2 1619 86100
Knob Switch
141 2 1619 86100
Knob Switch
+BTS-2 2.6x8
141 2 1619 86400
Knob Select
+BTS-2 2.6x8
+BTS-2 3x12
4 1329 76990
Indicator P.C.B. Assy
141 2 1619 86300
Knob Eject
141 2 3529 29200
Holder Knob Select
141 2 1619 86500
Knob Select
+BTS-2 3x12
141 2 1619 86400
Knob Select
+BTS-2 2.6x8
141 2 4729 04100
Lug
+BTS-2 3x12
141 2 2449 36000
Sheet
+BTS-2 3x8
+BTS-2 3x12
141 0 1119 77502
Cabinet Front Compl
141 2 1639 43200
Knob Volume
141 2 1639 43300
Knob Volume
+BTS-2 3x12
+BTS-2 3x12

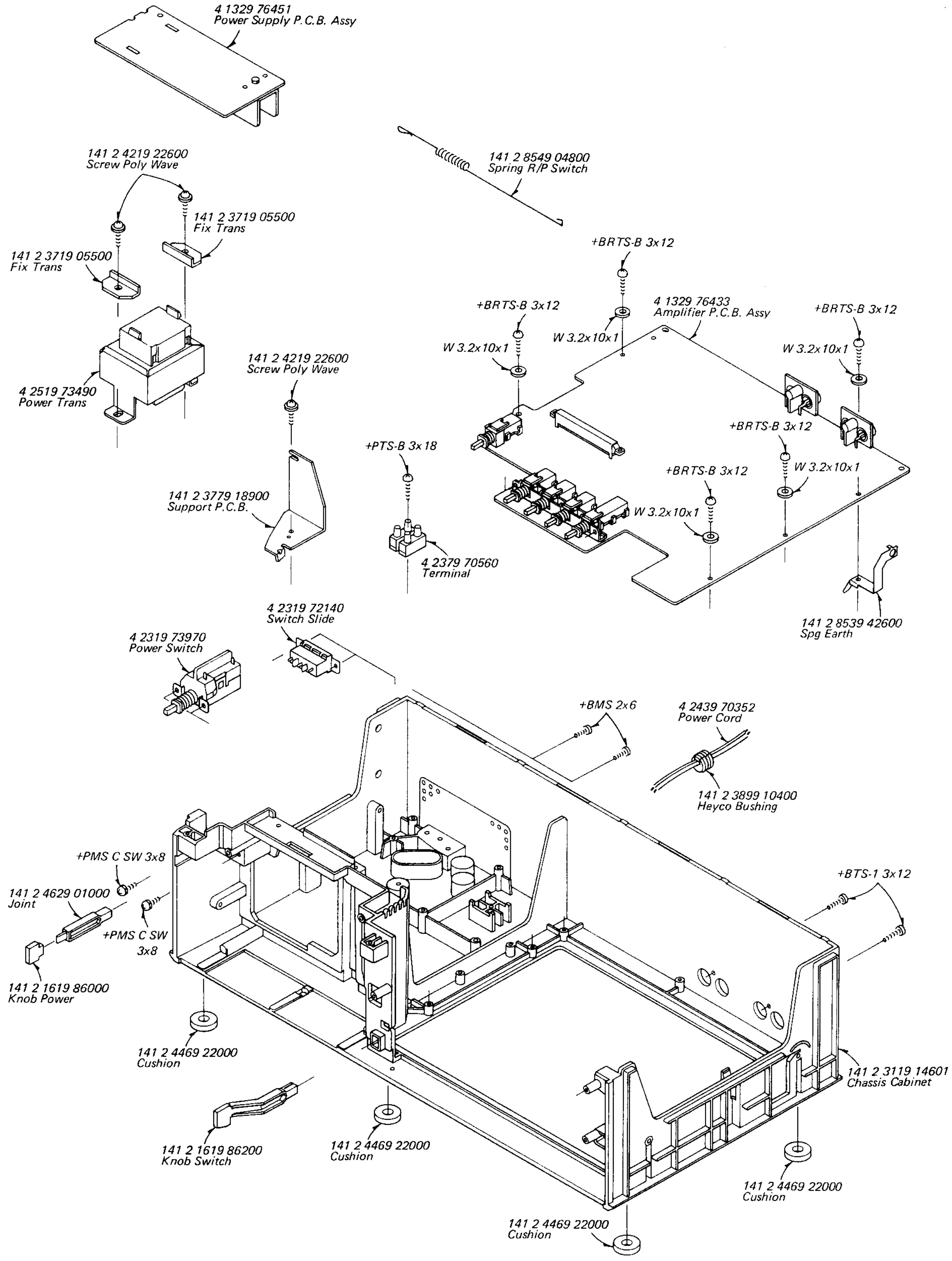
EXPLODED VIEW (Continued)

(Cabinet B)


4 6129 70480
Lamp
+BRTS-B 3x10
4 5119 70645
Indicator
+BRTS-B 3x10
+PTS-B 3x20
+PTS-B 3x20
+PTS-B 3x20
4 1329 76970
Headphone Jack P.C.B. Assy
141 2 3679 29400
Bracket Jack
4 1329 76950
Volume P.C.B. Assy
+PMS C SW 3x6
4 1329 76960
Mike Jack P.C.B. Assy
+BTS-2 3x12
+BTS-2 3x12
141 2 1219 18301
Plate Meter
+PTS-B 3x8
+BRTS-B 3x8
+BTS-2 3x12
141 2 1149 23600
Panel Chassis
+PTS-B 3x8
+PTS-B 3x8
141 2 8539 36700
Spring Earth
4 1329 76561
Connector P.C.B. Assy
+BTS-2 3x12
+PMS C SW 3x6
+PMS C SW 3x6
+BTS-2 3x12

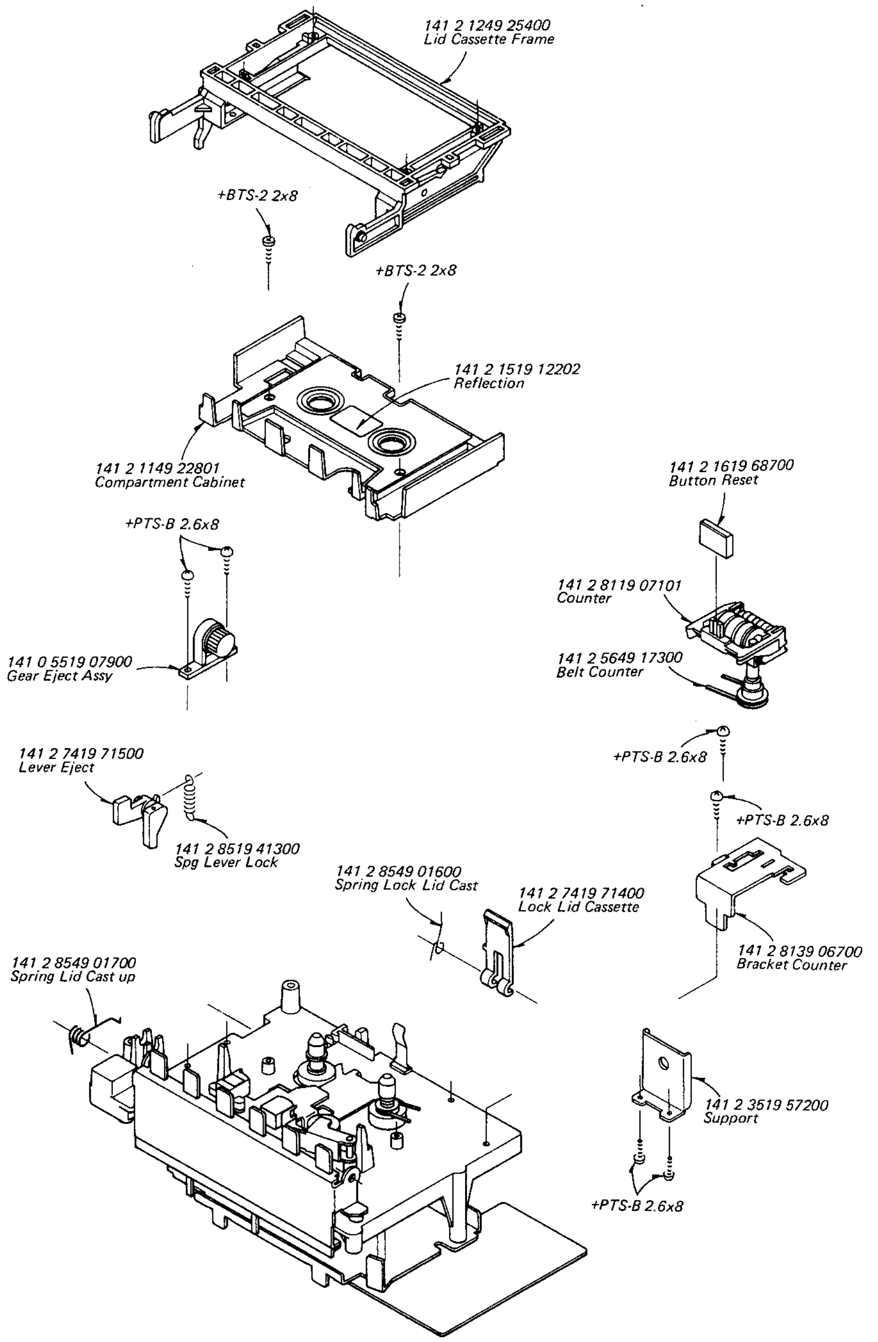
EXPLODED VIEW (Continued)

(Cabinet C)


4 1329 76451
Power Supply P.C.B. Assy
141 2 4219 22600
Screw Poly Wave
141 2 8549 04800
Spring R/P Switch
141 2 3719 05500
Fix Trans
141 2 3719 05500
Fix Trans
+BRTS-B 3x12
+BRTS-B 3x12
4 1329 76433
Amplifier P.C.B. Assy
+BRTS-B 3x12
W 3.2x10x1
W 3.2x10x1
W 3.2x10x1
141 2 4219 22600
Screw Poly Wave
4 2519 73490
Power Trans
+BRTS-B 3x12
+PTS-B 3x18
+BRTS-B 3x12
W 3.2x10x1
W 3.2x10x1
141 2 3779 18900
Support P.C.B.
4 2379 70560
Terminal
4 2319 72140
Switch Slide
141 2 8539 42600
Spg Earth
4 2319 73970
Power Switch
+BMS 2x6
4 2439 70352
Power Cord
141 2 3899 10400
Heyco Bushing
+PMS C SW 3x8
+BTS-1 3x12
141 2 4629 01000
Joint
+PMS C SW
3x8
141 2 1619 86000
Knob Power
141 2 4469 22000
Cushion
141 2 3119 14601
Chassis Cabinet
141 2 1619 86200
Knob Switch
141 2 4469 22000
Cushion
141 2 4469 22000
Cushion
141 2 4469 22000
Cushion

EXPLODED VIEW (Continued)

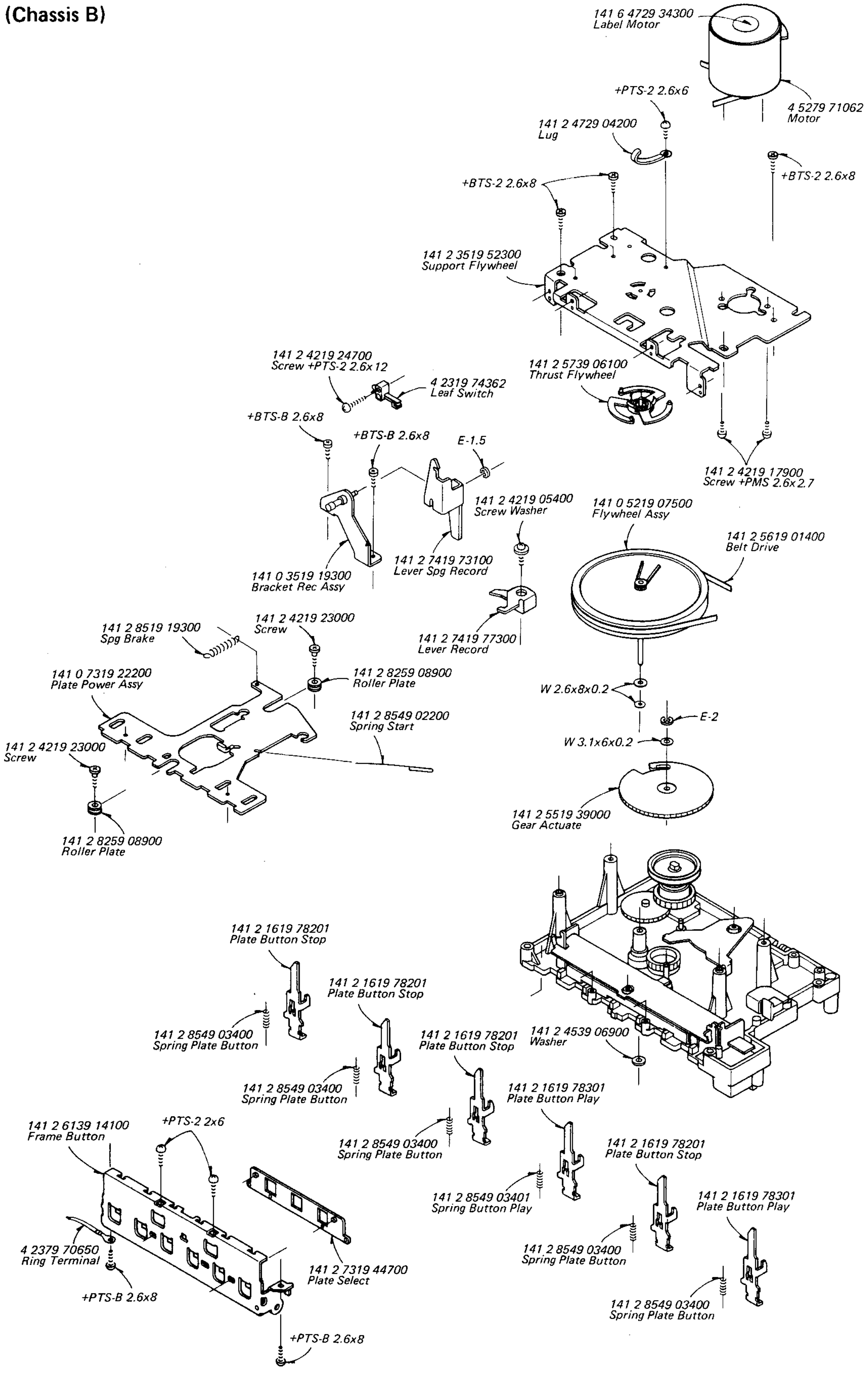
(Chassis A)



141 2 1249 25400
Lid Cassette Frame
+BTS-2 2x8
+BTS-2 2x8
141 2 1519 12202
Reflection
141 2 1149 22801
Compartment Cabinet
141 2 1619 68700
Button Reset
+PTS-B 2.6x8
141 2 8119 07101
Counter
141 0 5519 07900
Gear Eject Assy
141 2 5649 17300
Belt Counter
+PTS-B 2.6x8
141 2 7419 71500
Lever Eject
+PTS-B 2.6x8
141 2 8519 41300
Spg Lever Lock
141 2 8549 01600
Spring Lock Lid Cast
141 2 7419 71400
Lock Lid Cassette
141 2 8139 06700
Bracket Counter
141 2 8549 01700
Spring Lid Cast up
141 2 3519 57200
Support
+PTS-B 2.6x8

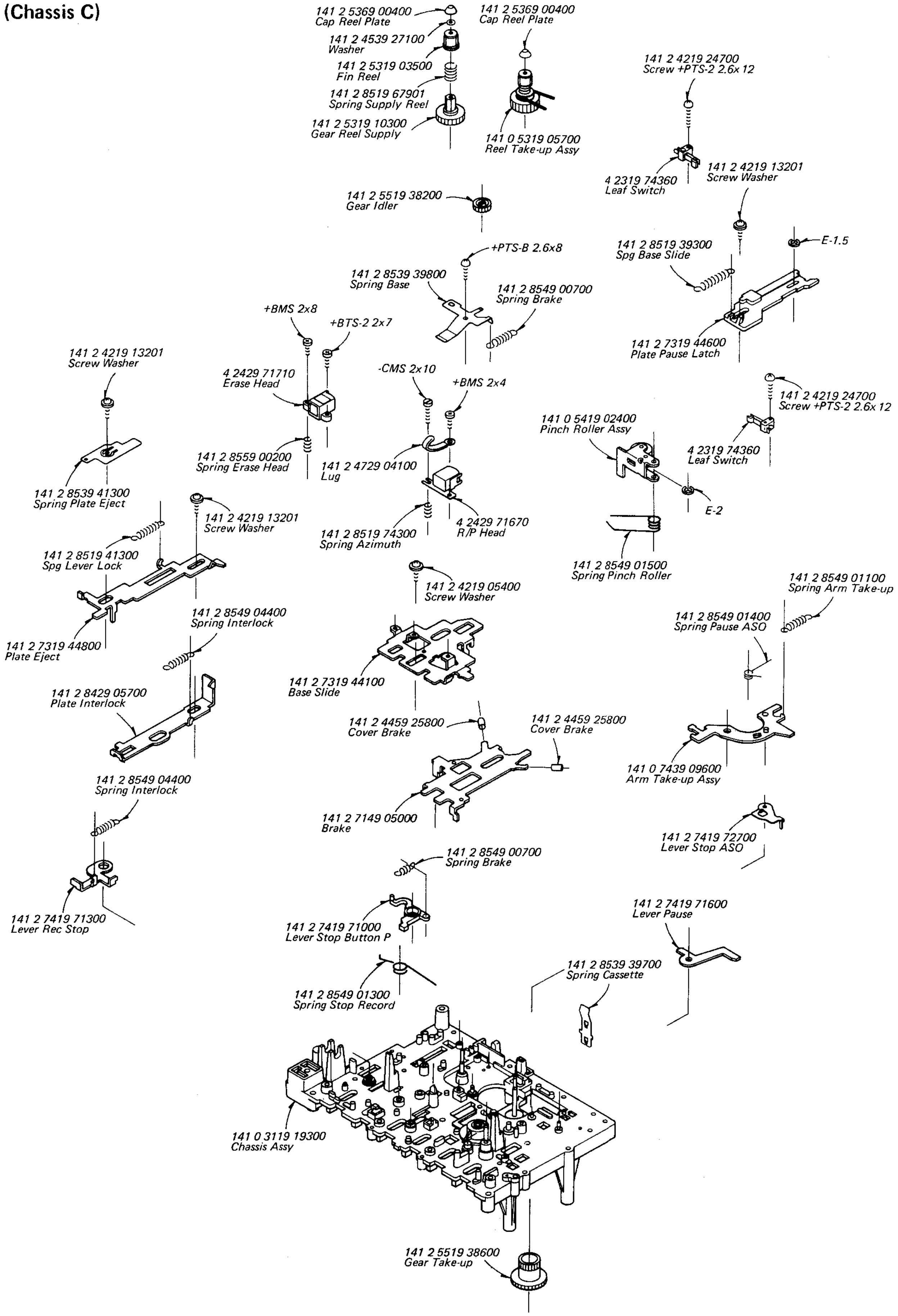
EXPLODED VIEW (Continued)

(Chassis B)


141 6 4729 34300
Label Motor
+PTS-2 2.6x6
4 5279 71062
Motor
141 2 4729 04200
Lug
+BTS-2 2.6x8
+BTS-2 2.6x8
141 2 3519 52300
Support Flywheel
141 2 4219 24700
Screw +PTS-2 2.6x12
4 2319 74362
Leaf Switch
141 2 5739 06100
Thrust Flywheel
+BTS-B 2.6x8
+BTS-B 2.6x8
E-1.5
141 2 4219 17900
Screw +PMS 2.6x2.7
141 2 4219 05400
Screw Washer
141 0 5219 07500
Flywheel Assy
141 2 5619 01400
Belt Drive
141 0 3519 19300
Bracket Rec Assy
141 2 7419 73100
Lever Spg Record
141 2 4219 23000
Screw
141 2 8519 19300
Spg Brake
141 2 7419 77300
Lever Record
141 0 7319 22200
Plate Power Assy
141 2 8259 08900
Roller Plate
W 2.6x8x0.2
E-2
141 2 8549 02200
Spring Start
W 3.1x6x0.2
141 2 4219 23000
Screw
141 2 5519 39000
Gear Actuate
141 2 8259 08900
Roller Plate
141 2 1619 78201
Plate Button Stop
141 2 1619 78201
Plate Button Stop
141 2 8549 03400
Spring Plate Button
141 2 1619 78201
Plate Button Stop
141 2 4539 06900
Washer
141 2 8549 03400
Spring Plate Button
141 2 1619 78301
Plate Button Play
141 2 6139 14100
Frame Button
+PTS-2 2x6
141 2 8549 03400
Spring Plate Button
141 2 1619 78201
Plate Button Stop
141 2 8549 03401
Spring Button Play
141 2 1619 78301
Plate Button Play
4 2379 70650
Ring Terminal
141 2 7319 44700
Plate Select
141 2 8549 03400
Spring Plate Button
+PTS-B 2.6x8
141 2 8549 03400
Spring Plate Button
+PTS-B 2.6x8

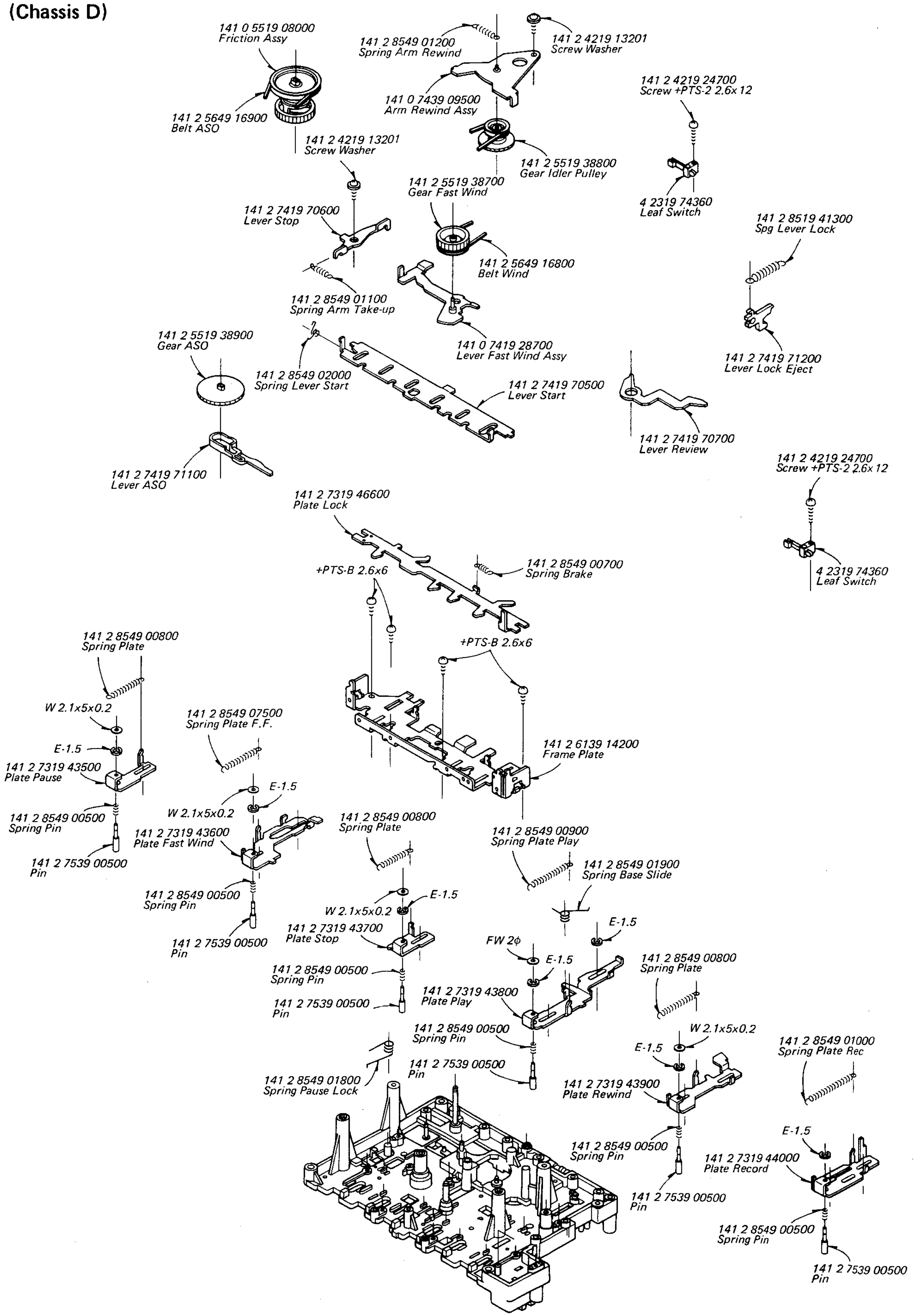
EXPLODED VIEW (Continued)

(Chassis C)

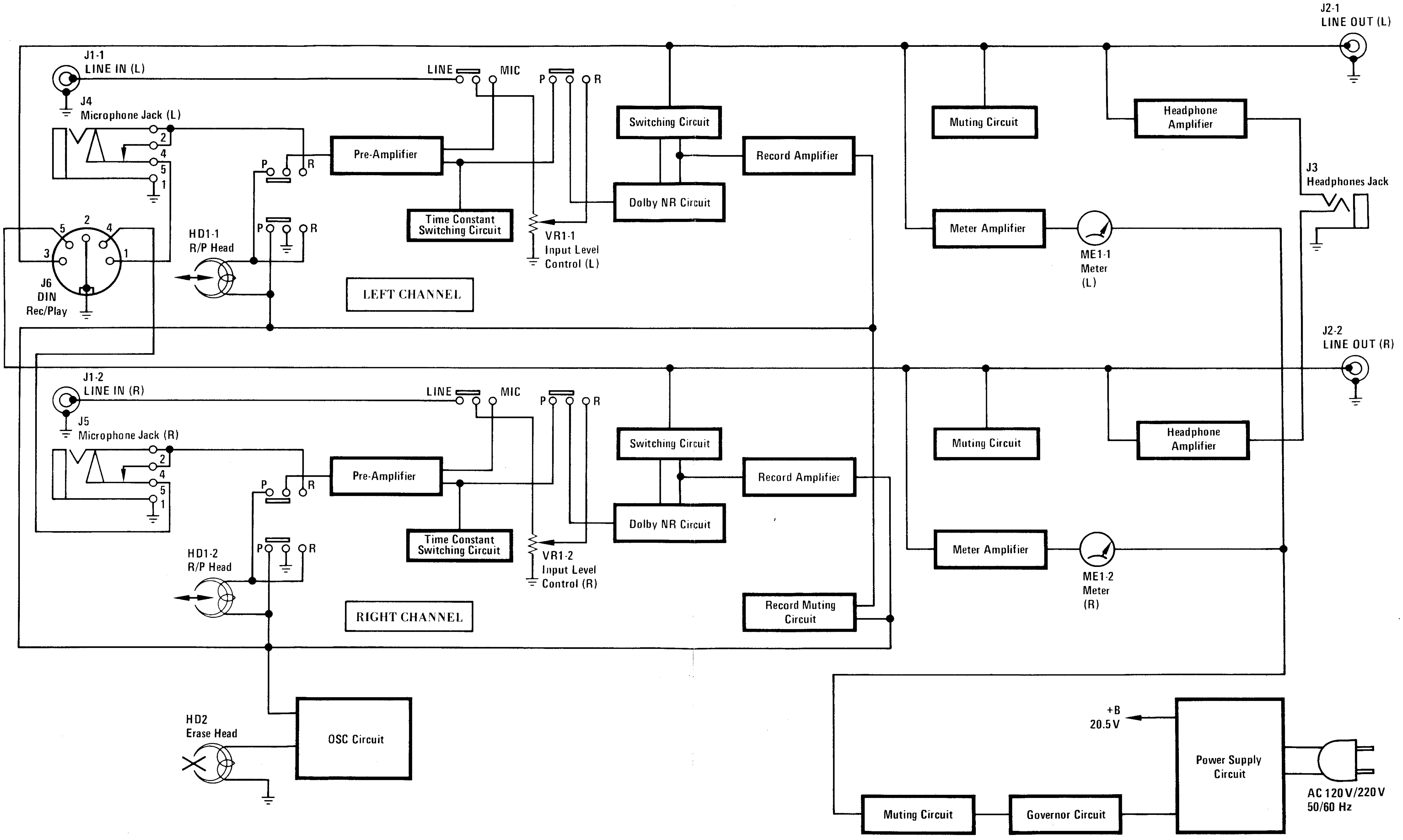

141 2 5369 00400
Cap Reel Plate
141 2 4539 27100
Washer
141 2 5319 03500
Fin Reel
141 2 8519 67901
Spring Supply Reel
141 2 5319 10300
Gear Reel Supply
141 2 5369 00400
Cap Reel Plate
141 0 5319 05700
Reel Take-up Assy
141 2 4219 24700
Screw +PTS-2 2.6x 12
4 2319 74360
Leaf Switch
141 2 4219 13201
Screw Washer
141 2 5519 38200
Gear Idler
+PTS-B 2.6x8
141 2 8539 39800
Spring Base
141 2 8549 00700
Spring Brake
141 2 8519 39300
Spg Base Slide
E-1.5
141 2 7319 44600
Plate Pause Latch
+BMS 2x8
+BTS-2 2x7
141 2 4219 13201
Screw Washer
4 2429 71710
Erase Head
-CMS 2x10
+BMS 2x4
141 2 4219 24700
Screw +PTS-2 2.6x 12
141 0 5419 02400
Pinch Roller Assy
4 2319 74360
Leaf Switch
141 2 8559 00200
Spring Erase Head
141 2 4729 04100
Lug
E-2
141 2 8539 41300
Spring Plate Eject
141 2 4219 13201
Screw Washer
4 2429 71670
R/P Head
141 2 8519 74300
Spring Azimuth
141 2 8519 41300
Spg Lever Lock
141 2 8549 01500
Spring Pinch Roller
141 2 4219 05400
Screw Washer
141 2 8549 01100
Spring Arm Take-up
141 2 8549 04400
Spring Interlock
141 2 8549 01400
Spring Pause ASO
141 2 7319 44800
Plate Eject
141 2 7319 44100
Base Slide
141 2 8429 05700
Plate Interlock
141 2 4459 25800
Cover Brake
141 2 4459 25800
Cover Brake
141 0 7439 09600
Arm Take-up Assy
141 2 8549 04400
Spring Interlock
141 2 7149 05000
Brake
141 2 7419 72700
Lever Stop ASO
141 2 8549 00700
Spring Brake
141 2 7419 71300
Lever Rec Stop
141 2 7419 71000
Lever Stop Button P
141 2 7419 71600
Lever Pause
141 2 8539 39700
Spring Cassette
141 2 8549 01300
Spring Stop Record
141 0 3119 19300
Chassis Assy
141 2 5519 38600
Gear Take-up

EXPLODED VIEW (Continued)

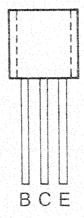
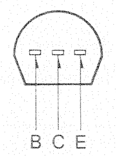
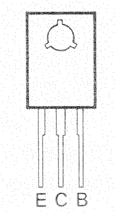
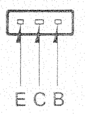
(Chassis D)


141 0 5519 08000
Friction Assy
141 2 8549 01200
Spring Arm Rewind
141 2 4219 13201
Screw Washer
141 2 4219 24700
Screw +PTS-2 2.6x 12
141 0 7439 09500
Arm Rewind Assy
141 2 5649 16900
Belt ASO
141 2 4219 13201
Screw Washer
141 2 5519 38800
Gear Idler Pulley
141 2 5519 38700
Gear Fast Wind
4 2319 74360
Leaf Switch
141 2 7419 70600
Lever Stop
141 2 8519 41300
Spg Lever Lock
141 2 5649 16800
Belt Wind
141 2 8549 01100
Spring Arm Take-up
141 2 5519 38900
Gear ASO
141 0 7419 28700
Lever Fast Wind Assy
141 2 7419 71200
Lever Lock Eject
141 2 8549 02000
Spring Lever Start
141 2 7419 70500
Lever Start
141 2 7419 70700
Lever Review
141 2 7419 71100
Lever ASO
141 2 4219 24700
Screw +PTS-2 2.6x 12
141 2 7319 46600
Plate Lock
141 2 8549 00700
Spring Brake
+PTS-B 2.6x6
4 2319 74360
Leaf Switch
141 2 8549 00800
Spring Plate
+PTS-B 2.6x6
W 2.1x5x0.2
141 2 8549 07500
Spring Plate F.F.
E-1.5
141 2 7319 43500
Plate Pause
141 2 6139 14200
Frame Plate
E-1.5
W 2.1x5x0.2
141 2 8549 00500
Spring Pin
141 2 7319 43600
Plate Fast Wind
141 2 8549 00800
Spring Plate
141 2 8549 00900
Spring Plate Play
141 2 7539 00500
Pin
141 2 8549 01900
Spring Base Slide
141 2 8549 00500
Spring Pin
E-1.5
W 2.1x5x0.2
E-1.5
141 2 7319 43700
Plate Stop
141 2 7539 00500
Pin
FW 2ϕ
E-1.5
141 2 8549 00800
Spring Plate
141 2 8549 00500
Spring Pin
141 2 7539 00500
Pin
141 2 7319 43800
Plate Play
W 2.1x5x0.2
141 2 8549 00500
Spring Pin
E-1.5
141 2 8549 01000
Spring Plate Rec
141 2 7539 00500
Pin
141 2 8549 01800
Spring Pause Lock
141 2 7319 43900
Plate Rewind
E-1.5
141 2 8549 00500
Spring Pin
141 2 7319 44000
Plate Record
141 2 7539 00500
Pin
141 2 8549 00500
Spring Pin
141 2 7539 00500
Pin

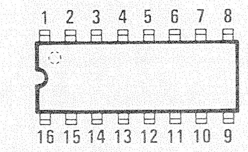
BLOCK DIAGRAM


J1-1
LINE IN (L)
J4
Microphone Jack (L)
2
4
5
1
LINE
MIC
P
R
Pre-Amplifier
Time Constant Switching Circuit
VR1-1
Input Level Control (L)
Switching Circuit
Record Amplifier
Dolby NR Circuit
Muting Circuit
Meter Amplifier
ME1-1
Meter
(L)
Headphone Amplifier
J2-1
LINE OUT (L)
J3
Headphones Jack
J6
DIN
Rec/Play
3
5
2
4
1
HD1-1
R/P Head
LEFT CHANNEL
J1-2
LINE IN (R)
J5
Microphone Jack (R)
Pre-Amplifier
Time Constant Switching Circuit
VR1-2
Input Level Control (R)
Switching Circuit
Record Amplifier
Dolby NR Circuit
Record Muting Circuit
Muting Circuit
Meter Amplifier
ME1-2
Meter
(R)
Headphone Amplifier
J2-2
LINE OUT (R)
HD1-2
R/P Head
RIGHT CHANNEL
HD2
Erase Head
OSC Circuit
+B
20.5V
Power Supply Circuit
AC 120V/220V
50/60 Hz
Muting Circuit
Governor Circuit

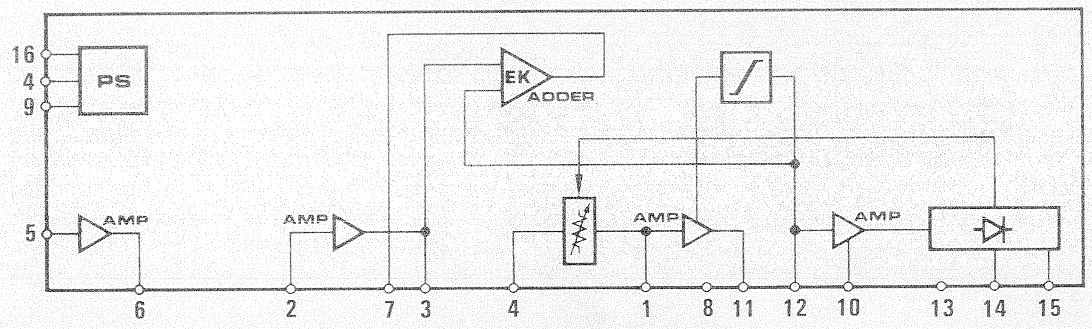
IC & TRANSISTOR LEAD IDENTIFICATION

FRONT VIEW	BOTTOM VIEW	TRANSISTOR
 B C E	 B C E	2SC693 2SC536 2SC1815
 E C B	 E C B	2SC1846
TERMINAL NAME		
B⇒ BASE C⇒ COLLECTOR E⇒ EMITTER		

NE646B BOTTOM VIEW

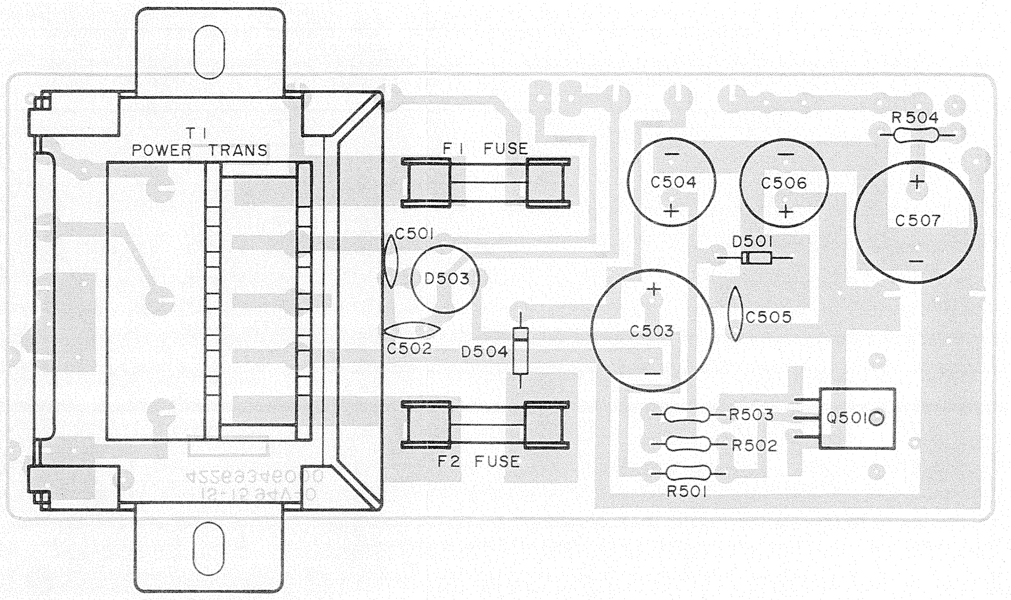

1 2 3 4 5 6 7 8
16 15 14 13 12 11 10 9

NE646B BLOCK DIAGRAM

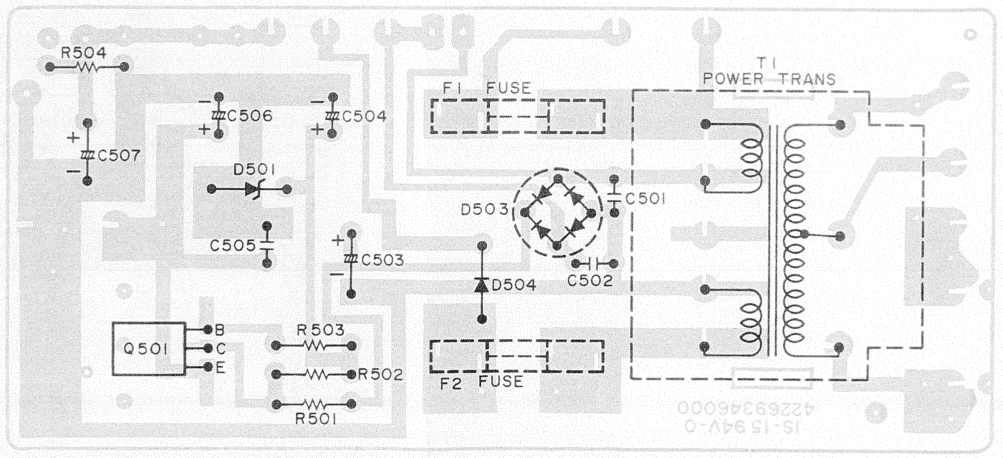

16
4
9
PS
EK
ADDER
5
AMP
AMP
AMP
AMP
6
2
7
3
4
1
8
11
12
10
13
14
15

POWER SUPPLY P.C.BOARD

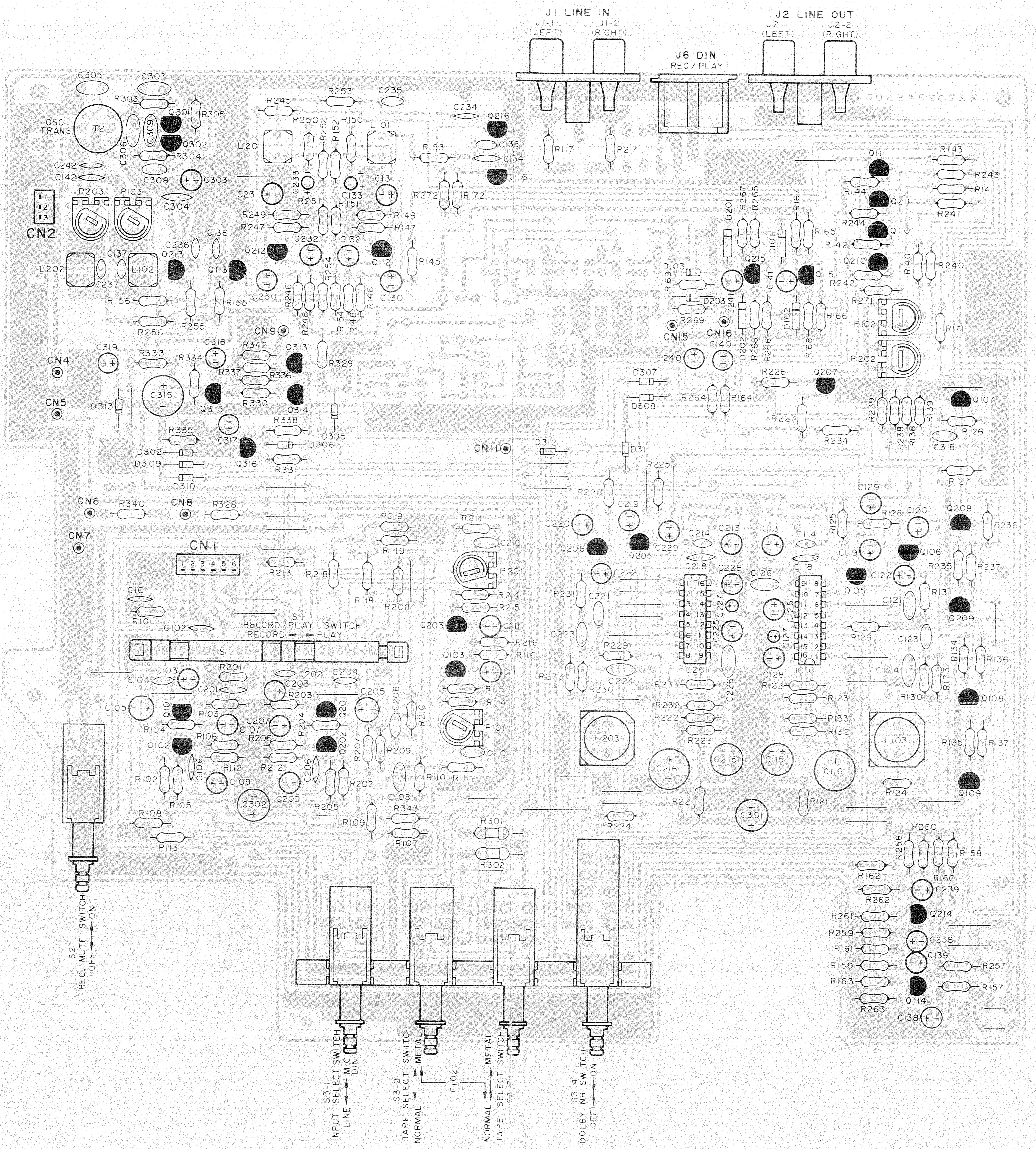
(Top View)


T1
POWER TRANS
F1 FUSE
F2 FUSE
C501
C502
C503
C504
C505
C506
C507
D501
D503
D504
R501
R502
R503
R504
Q501

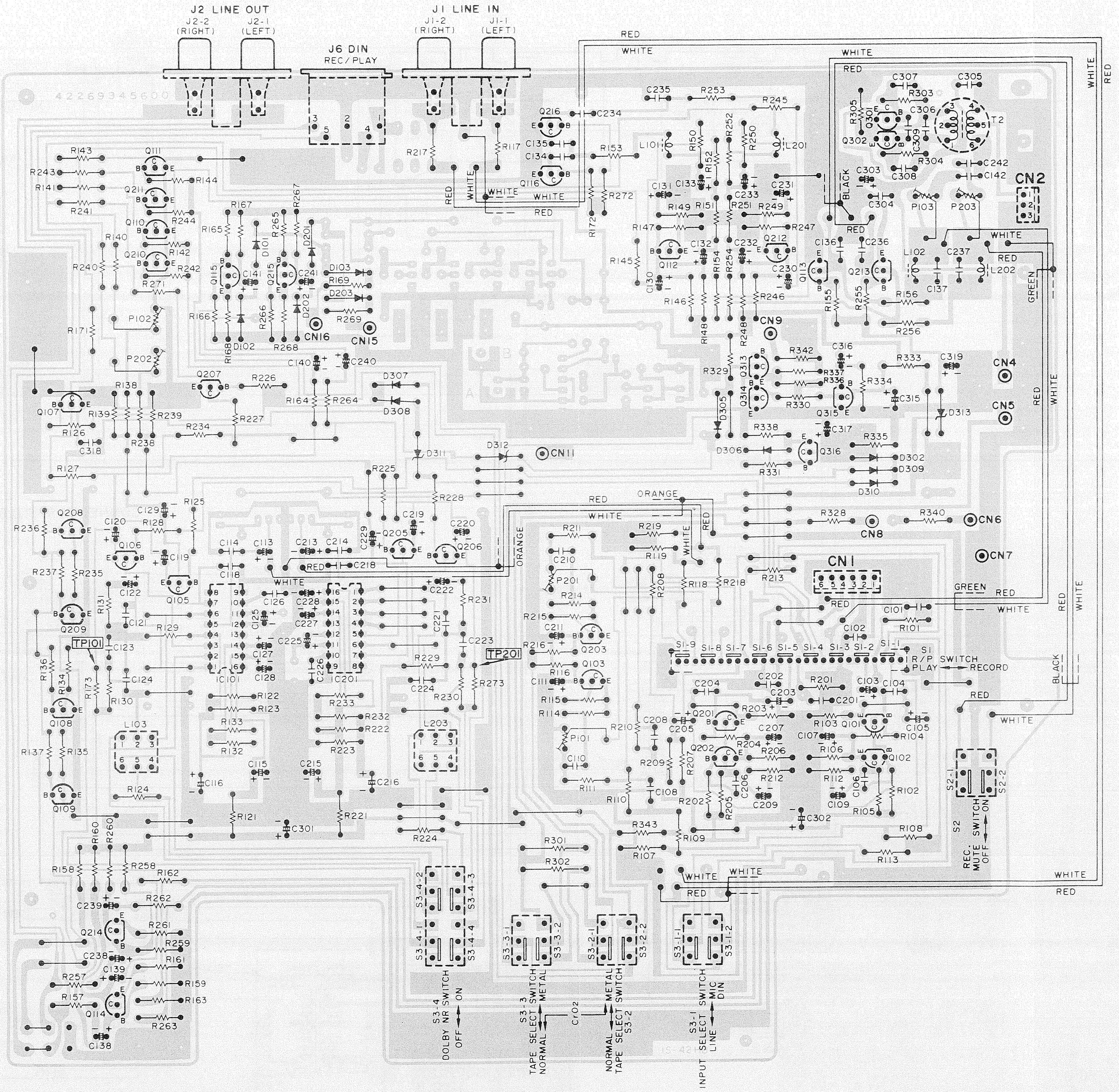
(Bottom View)


R504
C506
C504
C507
F1 FUSE
T1
POWER TRANS
D501
D503
C501
C505
C503
D504
C502
Q501
B
C
E
R503
R502
R501
F2 FUSE

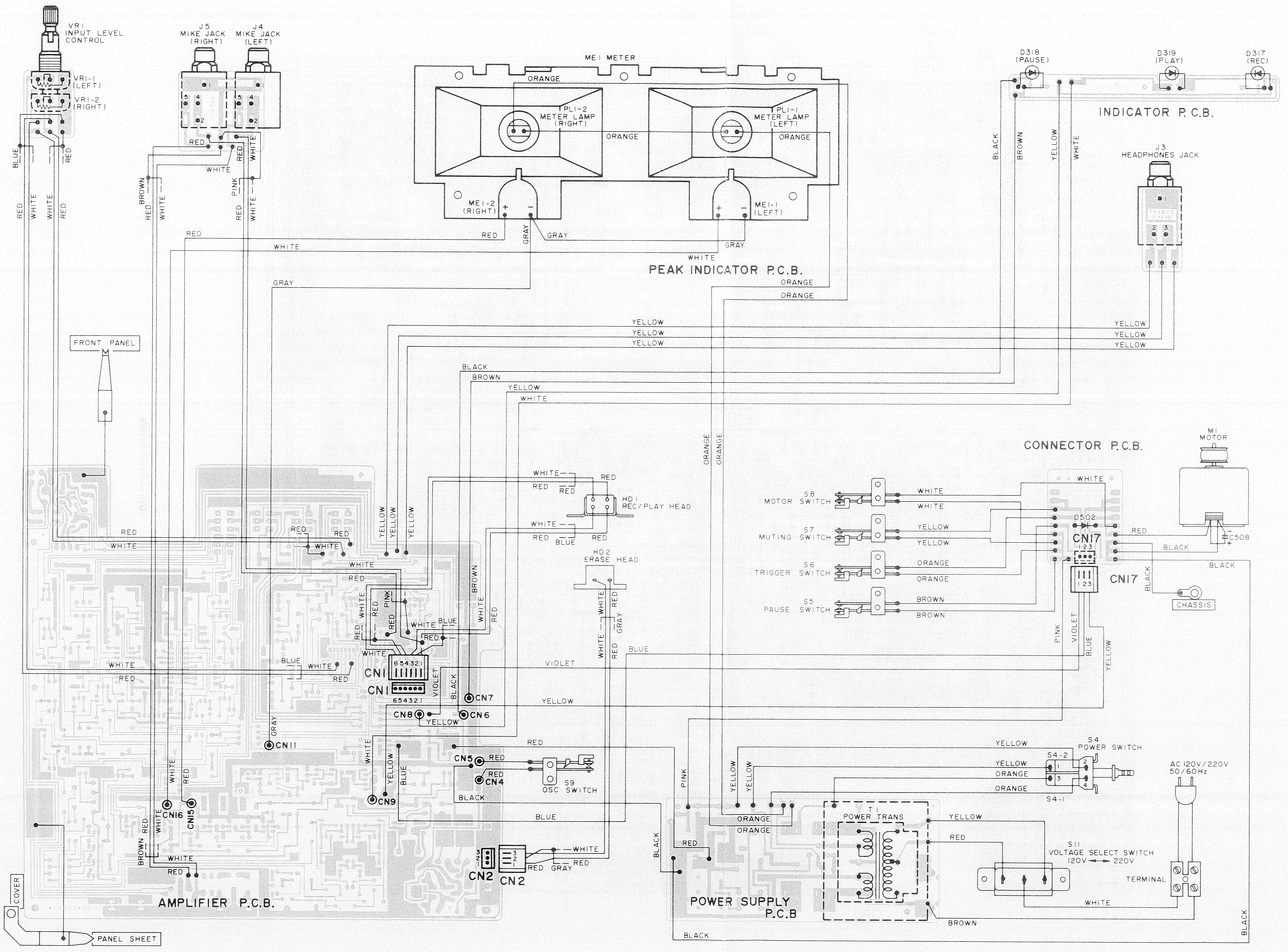
AMPLIFIER BASE P.C.BOARD (Top View)


J1 LINE IN
J1-1 (LEFT)
J1-2 (RIGHT)
J6 DIN
REC / PLAY
J2 LINE OUT
J2-1 (LEFT)
J2-2 (RIGHT)
OSC TRANS
T2
CN2
CN4
CN5
CN6
CN7
CN8
CN9
CN11
CN15
CN16
CN1
P101
P102
P103
P201
P202
P203
L101
L102
L103
L201
L202
L203
IC101
IC201
S1
RECORD/PLAY SWITCH
RECORD ←→ PLAY
S2
REC. MUTE SWITCH
OFF ←→ ON
S3-1
INPUT SELECT SWITCH
LINE ←→ MIC
DIN
S3-2
TAPE SELECT SWITCH
NORMAL ←→ METAL
CrO2
NORMAL ←→ METAL
TAPE SELECT SWITCH
S3-3
S3-4
DOLBY NR SWITCH
OFF ←→ ON

AMPLIFIER BASE P.C.BOARD(Bottom View)

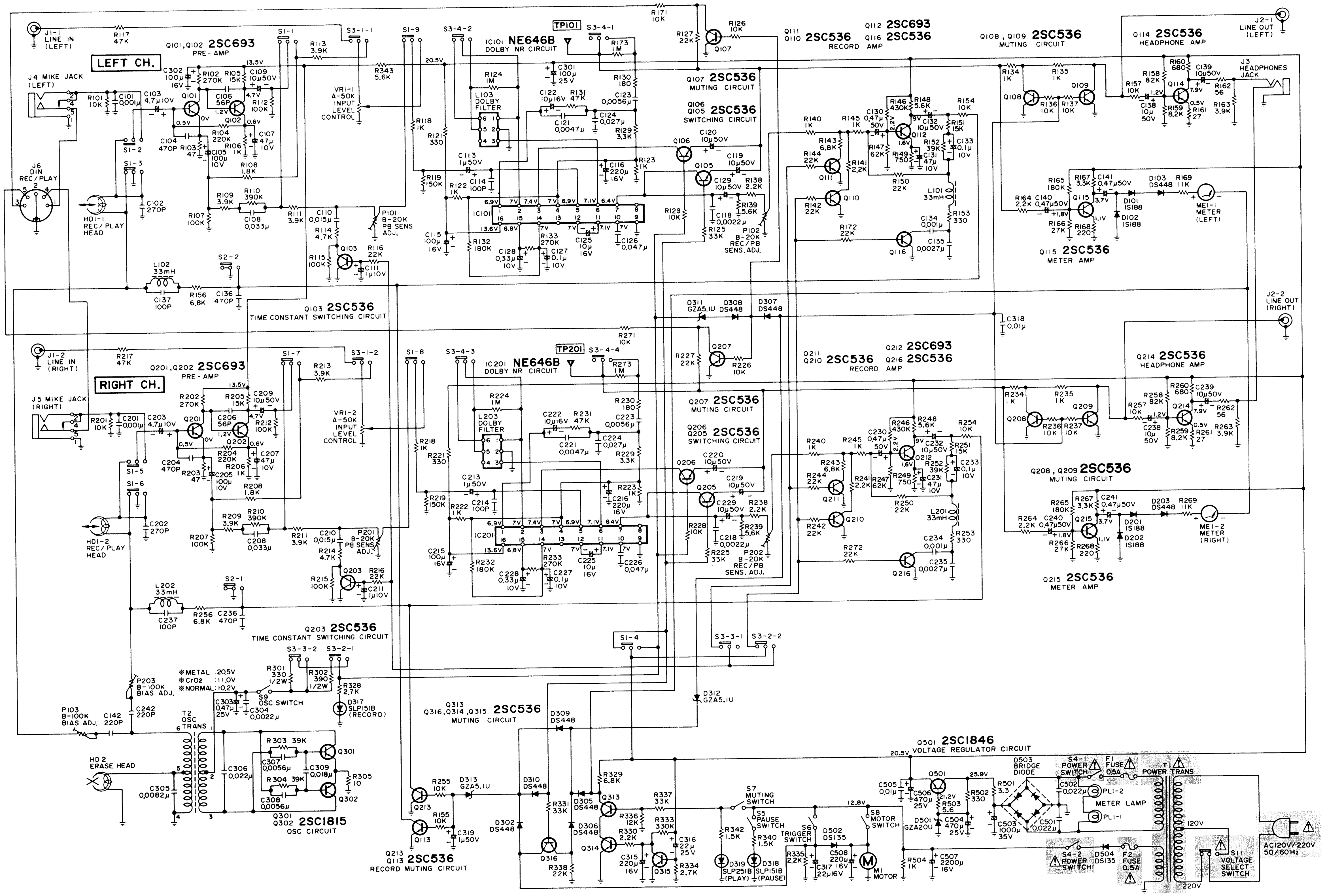

J2 LINE OUT
J2-2 (RIGHT)
J2-1 (LEFT)
J6 DIN REC/PLAY
J1 LINE IN
J1-2 (RIGHT)
J1-1 (LEFT)
RED
WHITE
GREEN
ORANGE
BLACK
CN1
CN2
CN4
CN5
CN6
CN7
CN8
CN9
CN11
CN15
CN16
TP101
TP201
IC101
IC201
L103
L203
T2
S1 R/P SWITCH PLAY ← → RECORD
S2 REC. MUTE SWITCH OFF ← → ON
S2-1
S2-2
S3-4 DOLBY NR SWITCH OFF ← → ON
S3-3 TAPE SELECT SWITCH NORMAL ← CrO2 → METAL
S3-2 TAPE SELECT SWITCH NORMAL ← → METAL
S3-1 INPUT SELECT SWITCH LINE ← → MIC DIN

WIRING DIAGRAM


VR1 INPUT LEVEL CONTROL
VR1-1 (LEFT)
VR1-2 (RIGHT)
J5 MIKE JACK (RIGHT)
J4 MIKE JACK (LEFT)
ME1 METER
PL1-2 METER LAMP (RIGHT)
PL1-1 METER LAMP (LEFT)
ME1-2 (RIGHT)
ME1-1 (LEFT)
PEAK INDICATOR P.C.B.
D318 (PAUSE)
D319 (PLAY)
D317 (REC)
INDICATOR P.C.B.
J3 HEADPHONES JACK
FRONT PANEL
HD1 REC/PLAY HEAD
HD2 ERASE HEAD
CONNECTOR P.C.B.
M1 MOTOR
S8 MOTOR SWITCH
S7 MUTING SWITCH
S6 TRIGGER SWITCH
S5 PAUSE SWITCH
D502
C508
CN17
CHASSIS
CN1
CN2
CN4
CN5
CN6
CN7
CN8
CN9
CN11
CN15
CN16
S9 OSC SWITCH
S4 POWER SWITCH
S4-1
S4-2
AC 120V/220V 50/60Hz
T1 POWER TRANS
S11 VOLTAGE SELECT SWITCH 120V ◄► 220V
TERMINAL
AMPLIFIER P.C.B.
POWER SUPPLY P.C.B
COVER
PANEL SHEET
RED
WHITE
BLUE
BROWN
PINK
GRAY
ORANGE
YELLOW
BLACK
VIOLET

No.	Name	Position
S1	RECORD/PLAYBACK Switch	PLAYBACK
S2	RECORD MUTE Switch	OFF
S3-1	INPUT SELECT Switch	LINE
S3-2	TAPE SELECT Switch	NORMAL
S3-3	TAPE SELECT Switch	NORMAL
S3-4	DOLBY NR Switch	OFF
S4	POWER Switch	OFF
S5	PAUSE Switch	OFF
S6	TRIGGER Switch	OFF
S7	MUTING Switch	OFF
S8	MOTOR Switch	OFF
S9	OSC Switch	OFF
S11	VOLTAGE SELECT Switch	220 V

SCHEMATIC DIAGRAM


J1-1 LINE IN (LEFT)
J4 MIKE JACK (LEFT)
J6 DIN REC/PLAY
HD1-1 REC/PLAY HEAD
LEFT CH.
Q101,Q102 2SC693 PRE-AMP
VR1-1 A-50K INPUT LEVEL CONTROL
P101 B-20K PB SENS ADJ.
Q103 2SC536 TIME CONSTANT SWITCHING CIRCUIT
TP101
IC101 NE646B DOLBY NR CIRCUIT
L103 DOLBY FILTER
Q107 2SC536 MUTING CIRCUIT
Q106 Q105 2SC536 SWITCHING CIRCUIT
P102 B-20K REC/PB SENS. ADJ.
Q111 Q110 2SC536 RECORD AMP
Q112 2SC693 Q116 2SC536
Q108,Q109 2SC536 MUTING CIRCUIT
Q114 2SC536 HEADPHONE AMP
J2-1 LINE OUT (LEFT)
J3 HEADPHONES JACK
ME1-1 METER (LEFT)
Q115 2SC536 METER AMP
J2-2 LINE OUT (RIGHT)
J1-2 LINE IN (RIGHT)
J5 MIKE JACK (RIGHT)
HD1-2 REC/PLAY HEAD
RIGHT CH.
Q201,Q202 2SC693 PRE-AMP
VR1-2 A-50K INPUT LEVEL CONTROL
P201 B-20K PB SENS ADJ.
Q203 2SC536 TIME CONSTANT SWITCHING CIRCUIT
TP201
IC201 NE646B DOLBY NR CIRCUIT
L203 DOLBY FILTER
Q207 2SC536 MUTING CIRCUIT
Q206 Q205 2SC536 SWITCHING CIRCUIT
P202 B-20K REC/PB SENS. ADJ.
Q211 Q210 2SC536 RECORD AMP
Q212 2SC693 Q216 2SC536
Q214 2SC536 HEADPHONE AMP
Q208,Q209 2SC536 MUTING CIRCUIT
ME1-2 METER (RIGHT)
Q215 2SC536 METER AMP
※METAL :20.5V
※CrO2 :11.0V
※NORMAL:10.2V
P203 B-100K BIAS ADJ.
P103 B-100K BIAS ADJ.
T2 OSC TRANS
HD2 ERASE HEAD
S9 OSC SWITCH
D317 SLP151B (RECORD)
Q301 Q302 2SC1815 OSC CIRCUIT
Q313 Q316,Q314,Q315 2SC536 MUTING CIRCUIT
Q213 Q113 2SC536 RECORD MUTING CIRCUIT
D312 GZA5.1U
S7 MUTING SWITCH
S5 PAUSE SWITCH
S6 TRIGGER SWITCH
S8 MOTOR SWITCH
D319 SLP251B (PLAY)
D318 SLP151B (PAUSE)
M1 MOTOR
Q501 2SC1846 VOLTAGE REGULATOR CIRCUIT
D503 BRIDGE DIODE
S4-1 POWER SWITCH
F1 FUSE 0.5A
T1 POWER TRANS
METER LAMP
PL1-1
PL1-2
S4-2 POWER SWITCH
F2 FUSE 0.5A
S11 VOLTAGE SELECT SWITCH
AC120V/220V 50/60Hz
120V
220V

PRODUCT SAFETY NOTICE

PRODUCT SAFETY SHOULD BE CONSIDERED WHEN A COMPONENT REPLACEMENT IS MADE IN ANY AREA OF AN UNIT. COMPONENTS INDICATED BY A MARK ⚠ IN THIS SCHEMATIC DIAGRAM SHOW COMPONENTS WHOSE VALUE HAS SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. IT IS PARTICULARLY RECOMMENDED THAT ONLY PARTS SPECIFIED ON THE ATTACHED PARTS LIST BE USED FOR COMPONENT REPLACEMENT POINTED OUT BY THE MARK.